# How to use this file...(Operators Manuals)

Instructions for
## Print Vendors (Paper Manuals)

**Paper Size:**
* 11 x 17
* Body—50 lbs brilliant white offset or equivalent.
* Cover—on pre-printed two-tone “Swash” stock.

**Press:**
* Body—1-color, 2-sided
* Cover imprint —1-color, 1-sided

**Bindery:**
* Saddle Stitch, Face Trim, 3-Hole Drill
* Face Trim

**COVERS:**
*** This file contains several manuals, which differ only in their covers.**
* Covers are all present at the beginning of this file.
* Back cover for a particular manual is the page IMMEDIATELY AFTER the front cover.
• Check the front cover for the individual part number (typically a 171xxxx number).

**BODY:**
**• The body of the manual is identical, regardless of the cover used.**
* REMEMBER: ODD number pages are ALWAYS right hand pages, and EVEN number are ALWAYS left hand pages.

**General:**
*** This instruction page is NOT part of the manual and must NOT be printed.**
• Pages labeled with the text “THIS PAGE INTENTIONALLY BLANK” are placement pages ONLY, and should NOT be printed.

---

If you have further questions on how to utilize this file, please contact
**Simplicity Technical Publications Department at (414) 284-8650.**

THIS PAGE INTENTIONALLY BLANK

Simplicity MASSEY FERGUSON AGCO

# Replacement
# OPERATOR'S MANUAL

## Regent / 500 / 2500 Series & Sport Series "Team Tractors"

### 14HP Gear Tractors

| Mfg. No. | Description |
|---|---|
| 1692593 | Regent, 14HP Gear |
| 1692595 | 514G, 14HP Gear |
| 1692597 | 2514G, 14HP Gear |
| 1692599 | Regent, 14HP Gear (Export) |

### 14HP Hydro Tractors

| Mfg. No. | Description |
|---|---|
| 1692354 | Regent, 14HP Hydro |
| 1692601 | Regent, 14HP Hydro (Export) |
| 1692588 | 514H, 14HP Hydro |
| 1692591 | 2514H, 14HP Hydro |

### 16HP Gear Tractors

| Mfg. No. | Description |
|---|---|
| 1692760 | Regent, 16HP Gear |
| 1692768 | Regent, 16HP Gear (Export) |
| 1692829 | 516G, 16HP Gear |

### 16HP Hydro Tractors

| Mfg. No. | Description |
|---|---|
| 1692762 | Regent, 16HP Hydro |
| 1692770 | Regent, 16HP Hydro (Export) |
| 1692831 | 516H, 16HP Hydro |
| 1692835 | 2516H, 16HP Hydro |

### Team Tractors

| Mfg. No. | Description |
|---|---|
| 1692957 | Vikings Regent Tractor |
| 1692959 | Steelers Regent Tractor |
| 1692961 | Panthers Regent Tractor |
| 1692963 | Chiefs Regent Tractor |
| 1692965 | Colts Regent Tractor |
| 1692967 | Badgers Regent Tractor |
| 1692969 | Hawkeyes Regent Tractor |
| 1692971 | Wolverines Regent Tractor |
| 1692973 | Spartans Regent Tractor |
| 1692975 | Nittany Lions Regent Tractor |
| 1692874 | Packers Regent Tractor |

### Mower Decks

| Mfg. No. | Description |
|---|---|
| 1692358 | 38" Mower Deck |
| 1692589 | 38" Mower Deck |
| 1692744 | 44" Mower Deck |
| 1692851 | 44" Mower Deck |
| 1692875 | 38" Mower Deck (Packers) |

Note: This Replacement Operator's Manual is a combination of several manuals no longer in production, but contains the same information as the Operator's Manual furnished with the original tractor.

**1713464-04**
Superceedes 1714904, 1714905, 1716576, & 1717288

Rev 1/2003
TP 100-2013-04-RG-SMA

MANUFACTURING, INC.
500 N Spring Street / PO Box 997
Port Washington, WI 53074-0997

www.simplicitymfg.com

© Copyright 1996, Simplicity Manufacturing, Inc.
All Rights Reserved. Printed in USA.

# Table Of Contents


**TRACTOR & MOWER IDENTIFICATION** ..... 2

**SAFETY RULES** ..... 3

**DECALS** ..... 5

**FEATURES & CONTROLS** ..... 6
- Controls - Hydro Models ..... 6
- Controls - Gear Models ..... 6

**OPERATION** ..... 7
- General ..... 7
- Safety Interlock System ..... 7
- Mower Installation & Removal ..... 8
- Adjusting Mower Height ..... 8
- Checks Before Starting ..... 9
- Clutch/Brake Pedal - Gear Models ..... 9
- Parking Brake ..... 9
- Starting The Engine ..... 9
- Driving The Tractor ..... 9
- Stopping the Tractor ..... 10
- Pushing the Tractor by Hand ..... 10

**MOWING TIPS** ..... 11

**NORMAL CARE** ..... 13
- Schedule ..... 13
- Raising the Hood & Seat ..... 13
- Checking/Adding Gasoline ..... 13
- Checking Tire Pressure ..... 14
- Checking the Fuel Filter ..... 14
- Lubrication ..... 14
- Transaxle - Hydro Models ..... 15
- Battery Maintenance ..... 15
  - Checking Battery Fluid ..... 15
  - Cleaning the Battery and Cables ..... 15
- Servicing the Mower Blades ..... 16

**STORAGE** ..... 17
- Temporary Storage ..... 17
- Long Term Storage ..... 17
- Starting After Storage ..... 17

**TROUBLESHOOTING & REPAIR** ..... 18
- General ..... 18
- Troubleshooting The Tractor ..... 18
- Troubleshooting The Mower ..... 19
- Checking the Battery ..... 20
- Charging A Completely Discharged Battery ..... 20
- Jump Starting with Auxiliary (Booster) Battery ..... 20

**ADJUSTMENTS** ..... 22
- Seat Adjustment ..... 22
- Steering Gear Adjustment ..... 22
- Brake Spring Adjustment ..... 22
- Brake Adjustment - Hydro ..... 23
- Brakel Adjustment - Gear ..... 23
- Mower Adjustments ..... 24
  - Leveling The Mower ..... 24
  - Blade Brake Check ..... 25

**BELT REPLACEMENT** ..... 25
- Mower Belt Replacement ..... 25
- Tractor Drive Belt Replacement ..... 26

**SPECIFICATIONS** ..... 27

**PARTS & ACCESSORIES** ..... 28
- Replacement Parts ..... 28
- Maintenance Items ..... 28
- Optional Accessories ..... 28
- Technical Literature ..... 28

**INTERNATIONAL SYMBOLS** ..... 29


*NOTE: In this manual, "left" and "right" are referred to as seen from the operating position.*

**⚠ WARNING**

**Engine exhaust from this product contains chemicals know, in certain quantities, to cause cancer, birth defects, or other reproductive harm.**

Printed in USA.

# Tractor & Mower Identification

## IDENTIFICATION NUMBERS

Record your model name/number, tractor and mower deck manufacturer numbers and engine serial number in the space provided for easy reference.

- The **Tractor I.D. tag** is located on the left-side, of the frame, as shown below.
- The **Mower Deck I.D. tag** is also on the left side, on top of the mower deck.
- For location of **Engine Serial Number**, refer to the Engine Owner's Manual.

Be sure to fill out and return the Warranty Registration Card supplied with your tractor.

| PRODUCT REFERENCE DATA | |
|---|---|
| Model Description Name/Number | |
| Tractor M/N (Manufacturer's Number) | S/N (Serial Number) |
| Mower Deck M/N (Manufacturer's Number) | S/N (Serial Number) |
| Dealer Name | Date Purchased |
| **ENGINE REFERENCE DATA** | |
| Engine Make/Model | Engine ID/Serial Number |

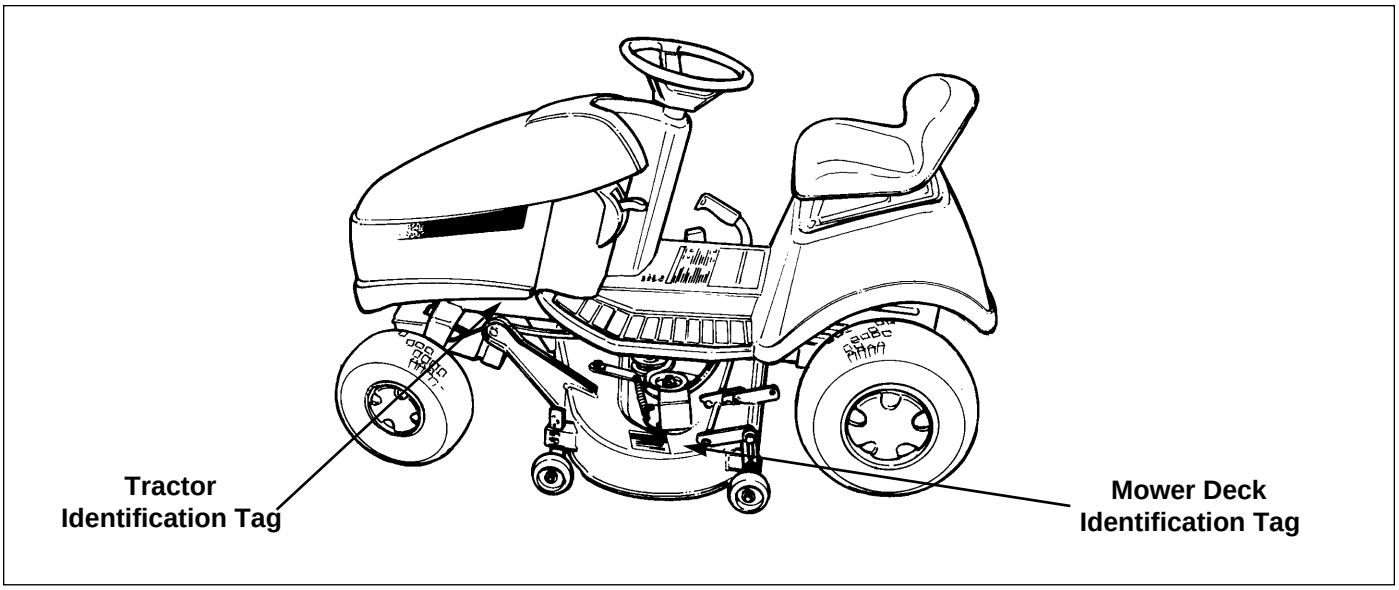



**Figure 1. Identification Tags Location**

Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment. **This mowing deck is capable of amputating hands and feet and throwing objects.** The triangle ⚠ in text signifies important cautions or warnings which must be followed.

## GENERAL OPERATION

- Read, understand, and follow all instructions in the manual and on the unit before starting.
- Only allow responsible adults, who are familiar with the instructions, to operate the unit.
- Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade(s).
- Be sure the area is clear of other people before mowing. Stop unit if anyone enters the area.
- Never carry passengers.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while travelling in reverse.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the deflector in place.
- Slow down before turning.
- Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting.
- Turn off the PTO switch to disengage the blades when not mowing.
- Stop engine before removing grass catcher or unclogging chute.
- Mow only in daylight or good artificial light.
- Do not operate the unit while under the influence of alcohol or drugs.
- Watch for traffic when operating near or crossing roadways.
- Use extra care when loading or unloading the unit into a trailer or truck.

## SLOPE OPERATION

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not mow it.

**⚠ WARNING - SLOPE OPERATION**

**Never operate on slopes greater than 30 percent (16.7°) which is a rise of three feet vertically in 10 feet horizontally. When operating on slopes that are greater than 15 percent (8.5°) but less than 30 percent use front counterweights and rear wheel weights (see your dealer). Select slow ground speed before driving onto slope. In addition to front and rear weights, use extra caution when operating on slopes with rear-mounted grass catcher. Mow UP and DOWN the slope, never across the face, use caution when changing directions and DO NOT START OR STOP ON SLOPE.**

### Do

- See your authorized dealer for recommendations of wheel weights or counterweights to improve stability.
- Mow up and down slopes, not across.
- Remove obstacles such as rocks, tree limbs, etc.
- Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
- Use slow speed. Choose a low gear so that you will not have to stop or shift while on the slope.
- Use extra care with grass catchers or other attachments. These can change the stability of the unit.
- Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction.

### Do Not

- *Do not* start or stop on a slope. If tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.
- *Do not* turn on slopes unless necessary, and then, turn slowly and gradually downhill, if possible.
- *Do not* mow near drop-offs, ditches, or embankments. The mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
- *Do not* mow on wet grass. Reduced traction could cause sliding.
- *Do not* try to stabilize the unit by putting your foot on the ground.
- *Do not* use grass catcher on steep slopes.

# Safety Rules

## CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the mowing activity. Never assume that children will remain where you last saw them.

- Keep children out of the mowing area and under the watchful care of another responsible adult.
- Be alert and turn unit off if children enter the area.
- Before and during reverse operation, look behind and down for small children.
- Never carry children. They may fall off and be seriously injured or interfere with safe unit operation.
- Never allow children to operate the unit.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

## TRANSPORTING AND STORAGE

**⚠ WARNING**

**When transporting this tractor on an open trailer, make sure unit is facing forward, toward the direction of travel. If tractor is facing backward, wind lift could cause damage to the hood.**

- Always observe safe refueling and fuel handling practices when refueling the tractor after transportation or storage.
- Always follow the engine manual instructions for storage preparations before storing the tractor for both short and long term periods.
- Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
- Never store the unit or fuel container inside where there is an open flame or pilot light, such as in a water heater. Allow unit to cool before storing.

## SERVICE AND MAINTENANCE

- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
  a) Use only an approved container.
  b) Never remove gas cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
  c) Never refuel the unit indoors.
- Never run a unit in an enclosed area.
- Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
- Never tamper with safety devices. Check their proper operation regularly.
- Keep unit free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Never make adjustments or repairs with the engine running unless specified otherwise in the engine manufacturer's manual.
- Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
- Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.
- Check brake operation frequently. Adjust and service as required.
- Use only factory authorized replacement parts when making repairs.
- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.

**⚠ WARNING**

**Never place hands near the hydro pump cooling fan when the tractor is running. Cooling fan is located on top of transaxle on hydro models.**

## GENERAL

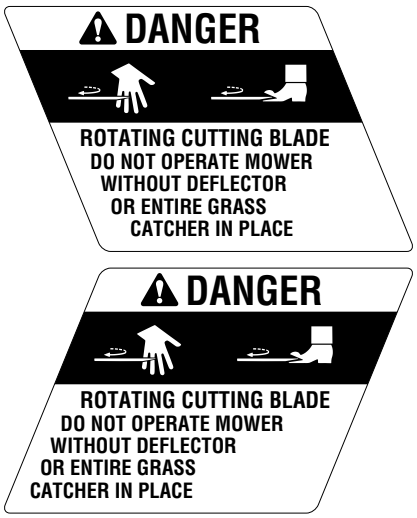
This unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your tractor.

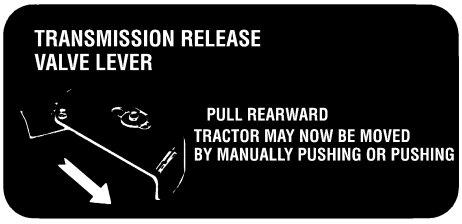
All WARNING, CAUTION and instructional messages on your tractor and mower should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important! The safety decals below are on your tractor and mower.

If any of these decals are lost or damaged, replace them at once. See your local dealer for replacements.

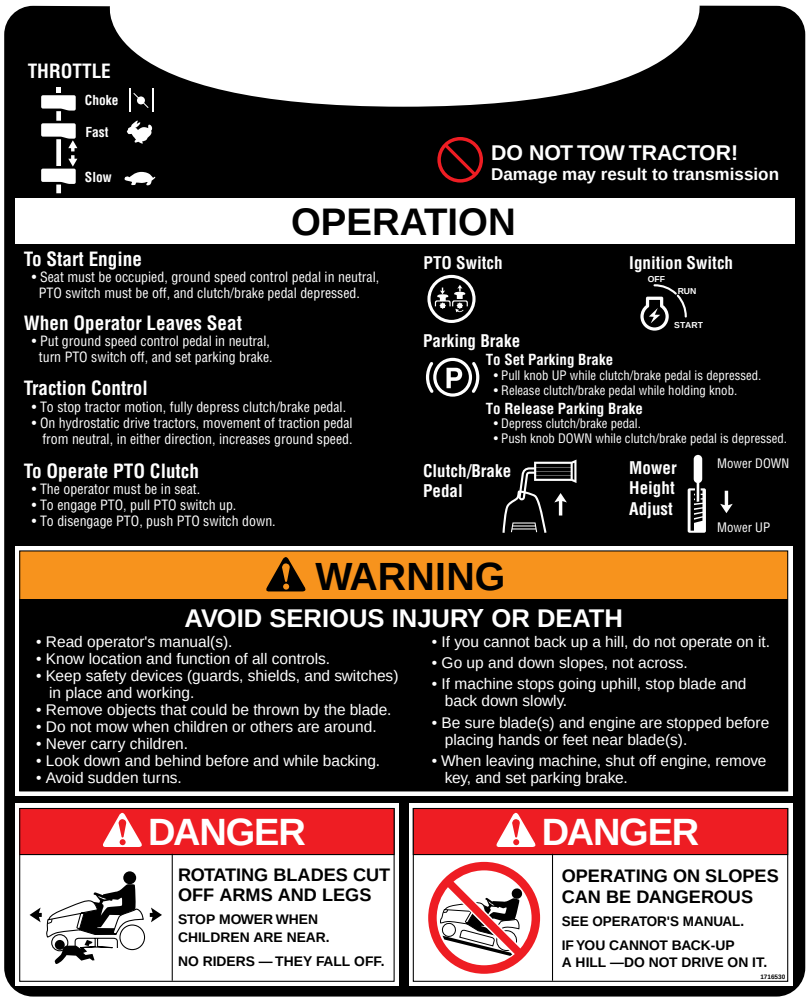
These labels are easily applied and will act as a constant visual reminder to you, and others who may use the equipment, to follow the safety instructions necessary for safe, effective operation.




**Decal - Danger**
**Part No. 1704276 (top decal)**
**Part No. 1704277 (bottom decal)**




**Decal - Hydro Release Valve**
**Part No. 1708918**


THROTTLE
Choke
Fast
Slow
DO NOT TOW TRACTOR!
Damage may result to transmission
OPERATION
To Start Engine
• Seat must be occupied, ground speed control pedal in neutral, PTO switch must be off, and clutch/brake pedal depressed.
When Operator Leaves Seat
• Put ground speed control pedal in neutral, turn PTO switch off, and set parking brake.
Traction Control
• To stop tractor motion, fully depress clutch/brake pedal.
• On hydrostatic drive tractors, movement of traction pedal from neutral, in either direction, increases ground speed.
To Operate PTO Clutch
• The operator must be in seat.
• To engage PTO, pull PTO switch up.
• To disengage PTO, push PTO switch down.
PTO Switch
Ignition Switch
OFF
RUN
START
Parking Brake
To Set Parking Brake
• Pull knob UP while clutch/brake pedal is depressed.
• Release clutch/brake pedal while holding knob.
To Release Parking Brake
• Depress clutch/brake pedal.
• Push knob DOWN while clutch/brake pedal is depressed.
Clutch/Brake Pedal
Mower Height Adjust
Mower DOWN
Mower UP
WARNING
AVOID SERIOUS INJURY OR DEATH
• Read operator's manual(s).
• Know location and function of all controls.
• Keep safety devices (guards, shields, and switches) in place and working.
• Remove objects that could be thrown by the blade.
• Do not mow when children or others are around.
• Never carry children.
• Look down and behind before and while backing.
• Avoid sudden turns.
• If you cannot back up a hill, do not operate on it.
• Go up and down slopes, not across.
• If machine stops going uphill, stop blade and back down slowly.
• Be sure blade(s) and engine are stopped before placing hands or feet near blade(s).
• When leaving machine, shut off engine, remove key, and set parking brake.
DANGER
ROTATING BLADES CUT OFF ARMS AND LEGS
STOP MOWER WHEN CHILDREN ARE NEAR.
NO RIDERS — THEY FALL OFF.
DANGER
OPERATING ON SLOPES CAN BE DANGEROUS
SEE OPERATOR'S MANUAL.
IF YOU CANNOT BACK-UP A HILL —DO NOT DRIVE ON IT.
1716530

**Decal - Operating Instructions**
**Part No. 1716530**

## CONTROLS - HYDRO MODEL

A. Steering Wheel
B. Engine Throttle Control
C. Parking Brake Knob
D. Ignition Key/Switch
E. Headlight Switch
F. PTO (Electric Clutch) Switch
G. Mower Height Adjustment Lever
H. Brake Pedal
I. Forward Direction Pedal
J. Rear Direction Pedal

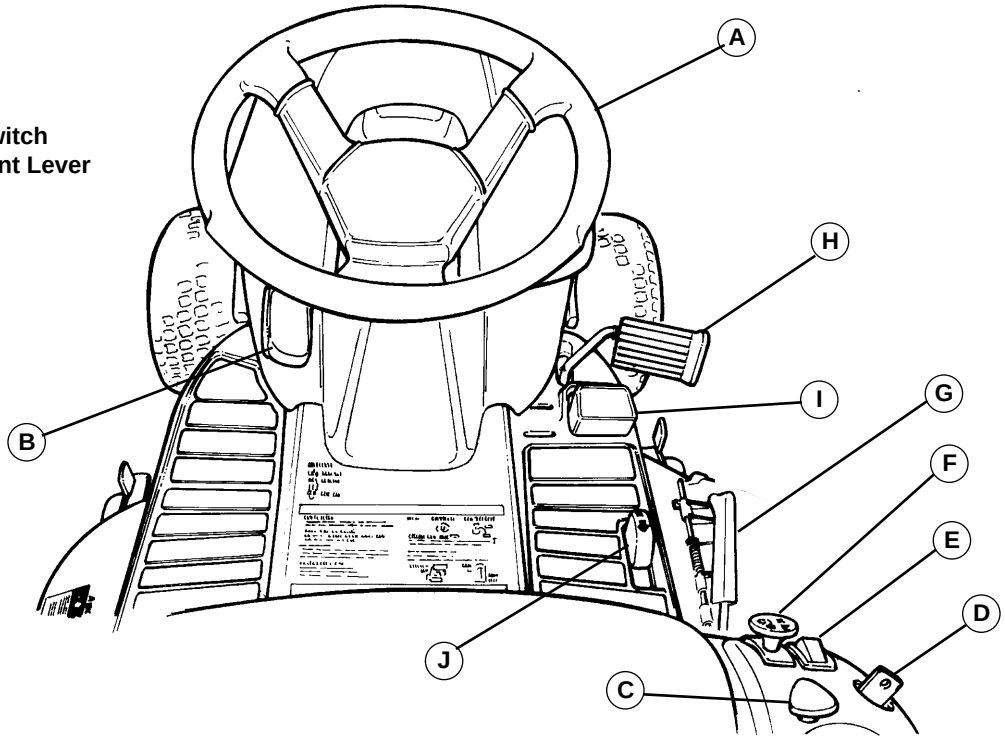



**Figure 2. Tractor & Mower Controls - Hydro Model**

## CONTROLS - GEAR MODEL

A. Steering Wheel
B. Engine Throttle Control
C. Parking Brake Knob
D. Ignition Key/Switch
E. Headlight Switch
F. PTO (Electric Clutch) Switch
G. Mower Height Adjustment Lever
H. Clutch/Brake Pedal
I. Gear Selector

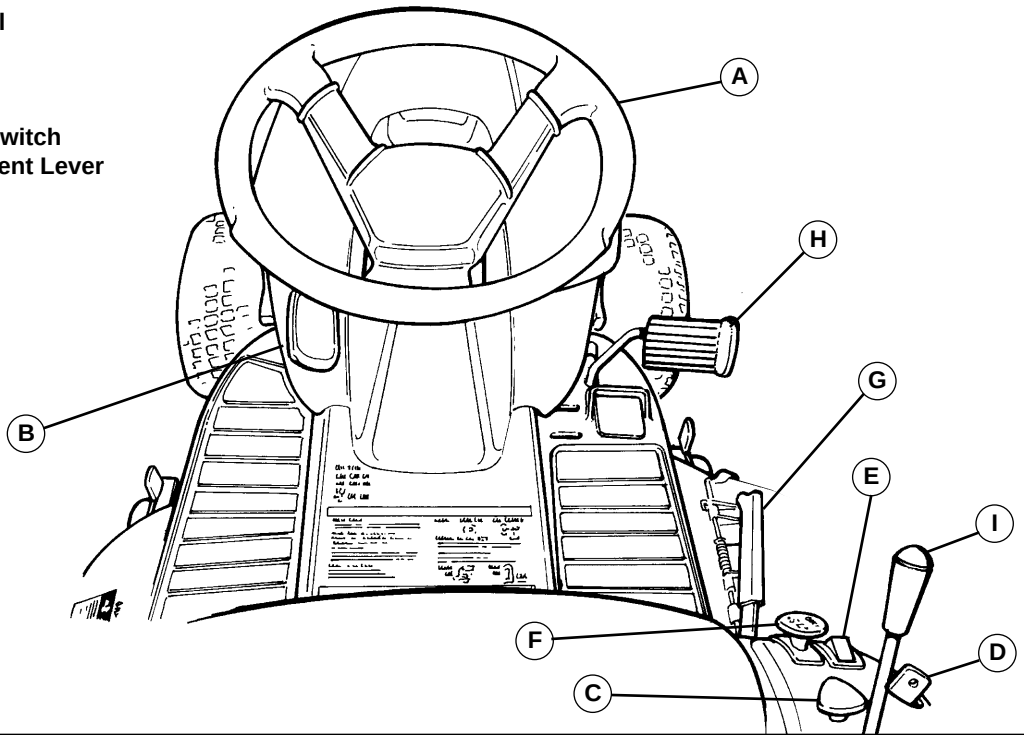



**Figure 3. Tractor & Mower Controls - Gear Model**

## GENERAL

Before first time operation, drive in an open area without mowing, to become accustomed to the unit. Be sure to read all information in the Safety and Operation sections before attempting to operate this tractor and mower.

**⚠ WARNING - SLOPE OPERATION**

**Never operate on slopes greater than 30 percent (16.7°) which is a rise of three feet vertically in 10 feet horizontally. When operating on slopes that are greater than 15 percent (8.5°) but less than 30 percent use front counterweights and rear wheel weights (see your dealer). Select slow ground speed before driving onto slope. In addition to front and rear weights, use extra caution when operating on slopes with rear-mounted grass catcher. Mow UP and DOWN the slope, never across the face, use caution when changing directions and DO NOT START OR STOP ON SLOPE.**

**⚠ WARNING**

**Never allow passengers to ride on the unit.**

**⚠ WARNING**

**Towing the tractor will cause transmission damage. Do not use another vehicle to push or pull tractor.**

**⚠ WARNING**

**To reduce fire hazard, keep the engine and mower free of grass, leaves and excess grease.**

**⚠ WARNING**

**The interlock safety switches are for your safety. Do not attempt to bypass them.**

## SAFETY INTERLOCK SYSTEM

Your tractor is equipped with a seat switch safety system. Check the seat switch operation every fall and spring with the following three tests.

### Test 1 - Engine should NOT crank if any of the following conditions exist:

- Transmission is out of neutral.
- PTO switch is engaged.
- Clutch/brake pedal is not fully depressed.

### Test 2 - Engine should crank if ALL of the following conditions are met:

- Transmission is in neutral.
- PTO switch is disengaged.
- Clutch/brake pedal is fully depressed.

### Test 3 - Engine should shut off if any of the following conditions exist:

- Operator rises off seat with transmission in gear and the clutch/brake pedal not fully depressed, and/or the parking brake is not set.
- Operator rises off seat with clutch/brake pedal not depressed;
- Operator rises off seat with PTO engaged.

*NOTE: Once the engine has stopped, the PTO switch (F, figures 2 & 3) must be turned off after operator returns to the seat in order to start the engine.*

**⚠ WARNING**

**If the tractor does not pass the test, do not operate tractor. See your authorized dealer. Under no circumstance should you attempt to defeat the purpose of the safety system.**

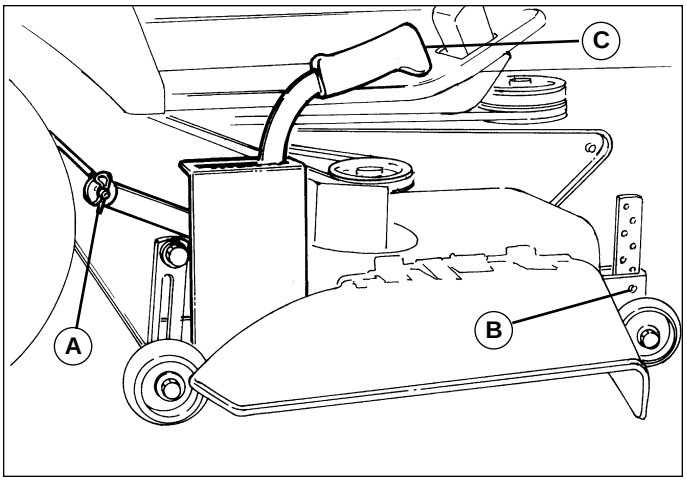



**Figure 4. Mower Deck - Right Side**
**A. Clip C. Height Adjustment Lever**
**B. Pin & Clip**

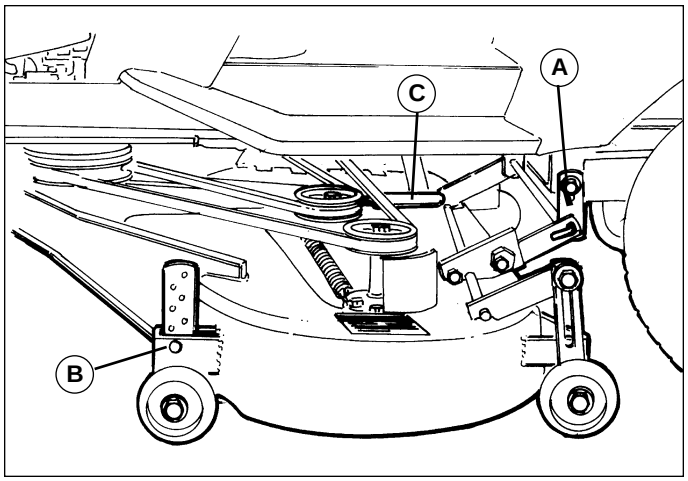



**Figure 5. Mower Deck - Left Side (38” Deck Shown)**
**A. Rod B. Pin & Clip C. Lever**

## MOWER INSTALLATION & REMOVAL

**⚠ WARNING**

**Engage parking brake, disengage PTO, stop engine and remove key before attempting to install or remove the mower.**

*NOTE: Perform mower removal and installation on a hard, level surface such as a concrete floor.*

1. Turn the front wheels of the tractor full left.
2. Place the mower in lowest cutting position.
3. Remove clip (A, figure 4) from right side of rod. Pull rod (A, figure 5) out from left side.
4. Move lever (C, figure 5) towards the right side of tractor to release belt tension, then slide belt off of PTO pulley.
5. Disconnect the front hitch by pulling out on the release rod (A, figure 6) and lifting the mower hitch off the tractor hitch. Slide the mower deck out from under the right side of the tractor.
6. Install the mower in the reverse order.

*NOTE: When installing rod (A, figure 5), turning the front wheels slightly left or right helps to align the holes.*

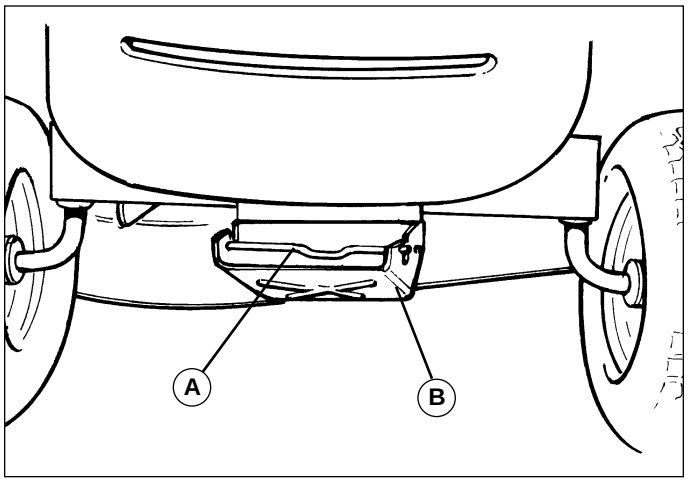



**Figure 6. Front Hitch**
**A. Release Rod B. Hitch**

### ADJUSTING MOWER CUTTING HEIGHT

*NOTE: Perform adjustment on a hard, level surface such as a concrete floor.*

1. Set the mower height adjustment lever (A, figure &) to the desired cutting height.
2. Remove the pin & clip (B, figures 7) from each mower deck front gauge wheel.
3. Adjust the gauge wheels to achieve the appropriate mower deck-to-ground clearance, as shown in figure 7. Reinstall pin & clip to each wheel.

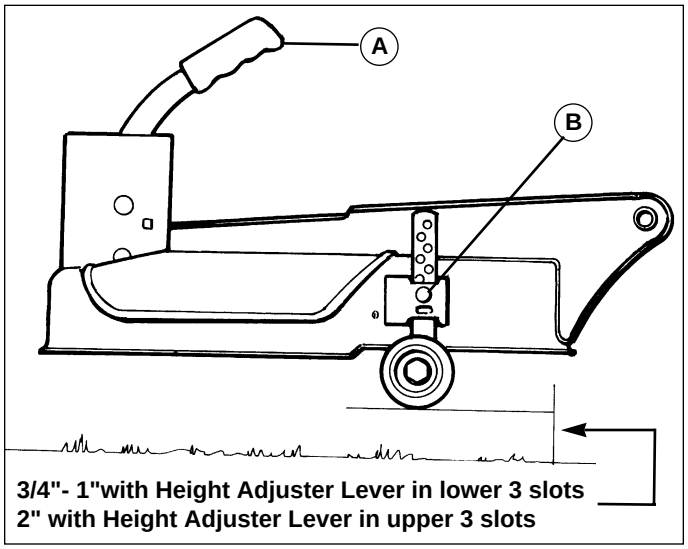



**Figure 7. Adjusting Mower Deck Gauge Wheels**
**A. Mower Height Adjustment Lever**
**B. Pin & Clip**

## CHECKS BEFORE STARTING

1. Make sure you have proper wheel or counterweights installed if required. See Slope Operation in the Safety Rules section. Make sure any slopes are within required limits.
2. Check that crankcase is filled to full mark on dipstick. See the engine Operator's Manual for instructions and oil recommendations.
3. Make sure all nuts, bolts, screws and pins are in place and tight.
4. Make sure you can reach all controls from operator's positions. If not, see SEAT ADJUSTMENT.
5. Fill the gasoline tank with fresh gasoline. Fill to bottom of filler neck to avoid spillage and overflow. DO NOT mix oil with gasoline. Refer to engine manual for gasoline recommendations.

**⚠ WARNING**

**Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do not allow open flame, smoking or matches in the area. Avoid overfilling and wipe up any spills.**

## CLUTCH/BRAKE PEDAL OPERATION

**On gear model,** depressing the pedal (A, figure 8) halfway disengages the transmission drive. Depressing pedal further applies the tractor brake.

**On hydro model,** depressing the pedal applies the tractor brake.

## PARKING BRAKE

Parking brake can be applied by fully depressing the brake pedal (A, figures 8), then pulling up on the parking brake knob (B, figure 8).

## STARTING THE ENGINE

1. While sitting in the operator seat, set the parking brake.
2. Set engine throttle control (B, figures 2 & 3) all the way up to CHOKE. A warm engine may not require choking.
3. Disengage the PTO by pushing the switch all the way down (F, figures 2 & 3)
4. **On hydro models,** with your foot off the pedals (I & J, figure 2) the tractor is in the neutral position.

   **On gear models,** put the gear selector (I, figure 3) in neutral.
5. Insert the key into the ignition switch (D, figure 2 & 3) and turn it to START.

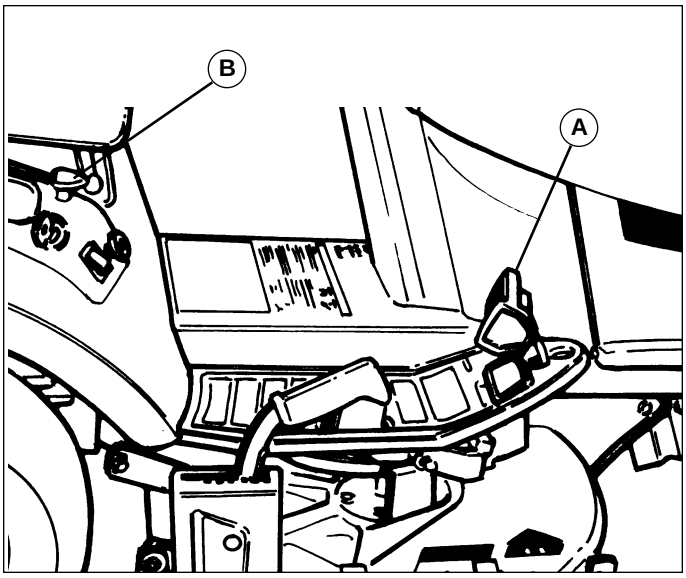



**Figure 8. Clutch/Brake Pedal Operation**
**A. Clutch/Brake Pedal - Gear Model**
**Brake Pedal - Hydro Model**
**B. Parking Brake Knob**

6. Move the engine throttle control (B, figures 2 & 3) to SLOW. Warm up the engine by running it for at least a minute before engaging the PTO switch or driving the tractor

## DRIVING THE TRACTOR

**⚠ WARNING**

**Make sure desired direction of travel is clear of objects, people and animals.**

**On hydro model,** ground speed is infinitely variable according to how far the pedals (I & J, figure 2) are moved in the forward or reverse position.

**On gear model,** ground speed is selected by fully depressing the clutch/brake pedal, then moving the gear selector (I, figure 3) to the appropriate position. Most mowing is done in 3rd or 4th gear with engine speed between 3/4 and full speed. If the terrain is rough, hilly or sloping, use first or second gear. If the grass is wet or over three inches (76mm) high, use full engine speed (with low gear) so the mower will have enough power to cut the grass. Shift gears only with tractor stopped and clutch/brake pedal fully depressed.

1. If you are ready to mow, set the mower to the desired cutting height. See Adjusting Mower Cutting Height, page 8.
2. Set engine throttle control (B, figures 2 & 3) for desired speed. Between 3/4 and full speed is recommended for mowing.
3. Engage the mower PTO by pulling up on the switch (F, figures 2 & 3).

4. **On hydro model,** release the parking brake by depressing the brake pedal (A, figure 8), then press down on either pedal (I or J, figure 2) for the desired direction and speed of travel.

   **On gear model,** fully depress clutch/brake pedal (A, figure 8) to release the parking brake and disengage the clutch. Use the gear selector (I, figure 3) to select the gear best suited for conditions, then slowly release clutch/brake pedal to engage clutch and start tractor in motion.

## STOPPING THE TRACTOR

1. **On hydro model,** gradually take your foot off the pedals (I & J, figure 2) to make a smooth stop. To make a more rapid stop, depress the brake pedal (H, figure 2).

   **On gear model,** press the clutch/brake pedal (A, figure 8) down only far enough to disengage the clutch to make a gradual stop. For a more rapid stop, press pedal down fully to apply the brake.
2. Engage the parking brake by pulling up on the knob (B, figure 8) with the brake pedal fully depressed.
3. Disengage the PTO by pushing down on the switch (F, figures 2 & 3).
4. Set engine throttle control to SLOW. Stopping a hot engine too fast may cause engine damage. Let engine idle for about a minute.
5. Turn key to OFF and remove it.

**⚠ WARNING**

**Before leaving the operator's position for any reason, engage the parking brake, disengage the PTO, stop the engine and remove the key.**

**⚠ WARNING**

**To reduce fire hazard, keep the engine, tractor and mower free of grass, leaves and excess grease. Do not stop or park tractor over dry leaves, grass or combustible materials.**

## PUSHING THE TRACTOR BY HAND

**⚠ WARNING**

**Do not tow the tractor. Damage will result to the transmission/transaxle.**

### Hydro Model

1. With engine off and key removed, disengage the PTO by pushing the switch (F, figures 2 & 3) all the way down.
2. See figure 9. The release lever is located under the rear tractor frame, above the transmission. Release lever must be in the rearward position to push the tractor by hand.

   To drive the tractor, release lever must be moved completely forward to engage the DRIVE position.

### Gear Model

1. With engine off and key removed, disengage the PTO by pushing the switch (F, figures 2 & 3) all the way down.
2. Place the gear selector in the NEUTRAL position.
3. Unlock parking brake.

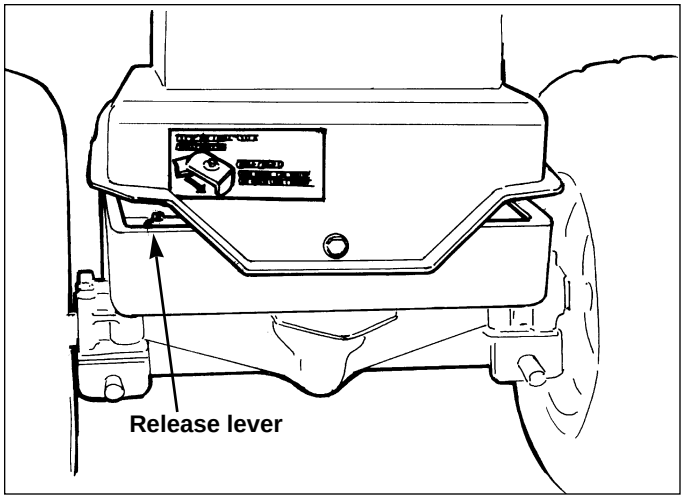



**Figure 9. Release Lever - Hydro Models**

## GENERAL

For the first use of the mower, choose a smooth level area. Cut long straight strips overlapping slightly.

The size and type of area to be mowed determines the best mowing pattern to use. Obstructions such as trees, fences and buildings must also be considered. Where possible, make one or two passes in a counterclockwise direction around the outside of the area to keep the cut grass off fences and walks. The remainder of the mowing should be done in a clockwise direction so the clippings are dispersed on the cut area.

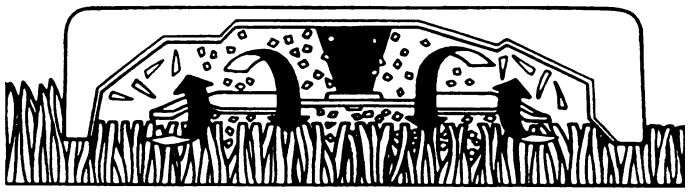
Keep in mind the following lawn care and mowing tips:

- Too much maintenance is as detrimental to your lawn as neglect.
- Mow when grass is 3-5 inches tall. Don't cut shorter than 2 to 2-1/2 inches. Cut only the top one-third of the grass blade. Cutting below this level can lead to thatch problems. Your mower has a cutting height adjustment that can help you maintain a proper length.
- For extremely tall grass, set the cutting height at maximum for the first pass, and then reset to the desired height and mow again.
- Mow often. Short clippings of an inch or less decompose more quickly than longer blades.
- Keep the blades on your mower sharp for finer clippings.
- Let grass grow a bit longer when it is hot to reduce heat build-up and protect grass from heat damage.
- Use slow-release fertilizer for slow, even growth.
- Don't cover grass surface with a heavy layer of clippings. Consider using a grass collection system and starting a compost pile.
- Aerate lawn in spring, consider renting an aerator which removes cores of soil from the lawn. This increases the speed of clipping decomposition and deep root growth by opening up the soil and permitting greater movement of water, fertilizer and air.
- Don't over-water. Too much water can encourage disease development.
- Mow when the grass is dry, preferably in the late afternoon when the temperatures are cooler.
- Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.
- For wet grasses, grasses prone to wheel tracking and for collecting clippings:
  a. Use sharp blades.
  b. Adjust deck 1/4" higher in front than in rear.
  c. Run at maximum engine speed but slow ground speed.
  d. Clean deck of built-up material/caked-on grass.
  e. Check for free movement of mower idler pulley.
- For dry conditions where grass blow-out is a problem:
  a. Use sharp blades.
  b. Adjust deck flat to 1/8" maximum lower in front.
  c. Use 3/4 engine speed.
  d. Clean deck of built-up material/caked-on grass.

## MULCHING MOWER OPERATION (OPTIONAL KIT ATTACHMENT)

### Mulching

Mulching consists of actually cutting and recutting clippings into tiny particles and blowing them into the lawn. These tiny particles decompose rapidly into by-products your lawn can use. Under proper conditions, your mulching mower will virtually eliminate noticeable clippings on the lawn surface.



Keep in mind these mulching tips:

- Use mulching mower or mulcher kit without shredders for grass mulching.
- Install shredders for leaf shredding.
- Use maximum engine speed.
- Raise height of cut if excessive power is used.
- Must use sharp blades. Do not use lift tabs or high lift blade when mulching.
- Adjust to lower ground speeds in heavy grass or if wind rowing is present.
- Clean deck of built-up material/caked-on grass.
- Check for free movement of mower idler pulley.

### Mowing Conditions

The best mulching results from mowing when lawn is dry and grass blades are not over 5" long. Follow these guidelines for best results:

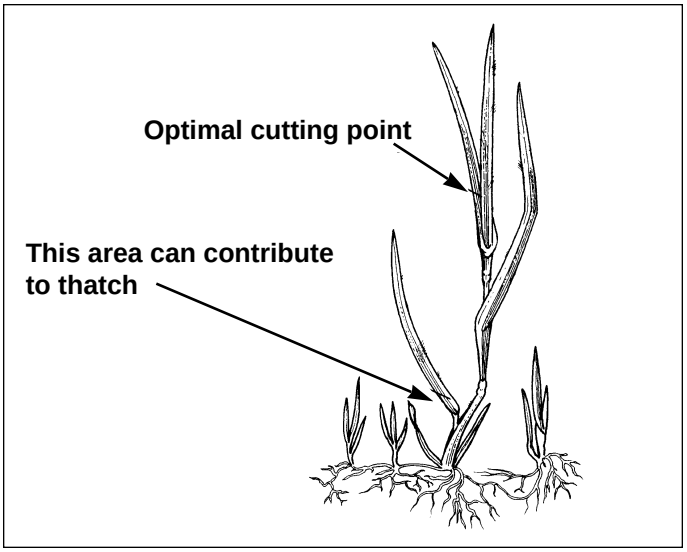
- Do not use the mower as a mulching mower during the first two or three mowings in the spring. The long grass blades, quick growth, and often wetter conditions are more suitable for side-discharge (broadcasting) or grass bagging operation.
- Avoid mulching after rain or heavy dew. It may be better to mow later in the day or early evening when lawn is drier.

# Mowing Patterns & Tips

- Change the mowing pattern each time.
- If mulching baffles are removed, the original deflector must be in operating position for safe side-discharge mowing.

## How Much Grass To Cut Off

Removing too much grass height in one cutting may result in an unsatisfactory cut: wind rowing, clumping, or uneven dispersal of clippings may result. It is best to mow when the grass is between 3"- 5" tall, although this will depend on your personal preference for lawn appearance. A good rule to follow is to cut only the top one-third of the grass blade at a time (maximum of 1-1/2"). Cutting more off the grass blade, particularly in wet spring conditions, can lead to thatch problems.




## Engine Speed & Ground Speed

Use full engine throttle matched with a slower ground speed so that clippings will be finely cut. A better cut may result from cutting the same area in two passes, each time cutting only 3/4" of grass blade. Short clippings of 1" or less decompose more quickly than longer blades.

*NOTE: When mulching under heavy cutting conditions, a rumbling sound may be present and is normal.*

## The Proper Equipment

Always keep the mower blades sharp and balanced. Blades should be sharpened at the beginning of every mowing season. If the tips of grass blades brown after cutting, this may be a sign of dull blades tearing, rather than cutting, the grass blades.

Keep the underside of the mower deck and baffles clean so that clippings are properly circulated, chopped, and discharged back into the lawn.

## The Best Combination

We recommend that you experiment with the height of cut position and tractor ground speed that will give you the best cut. Start with a higher cutting height and try increasing lower settings until you find a cutting height that is matched to your mowing conditions and preferences. Since mulching requires more horsepower than side-discharging, using a slower ground speed is important for proper mulching operation.

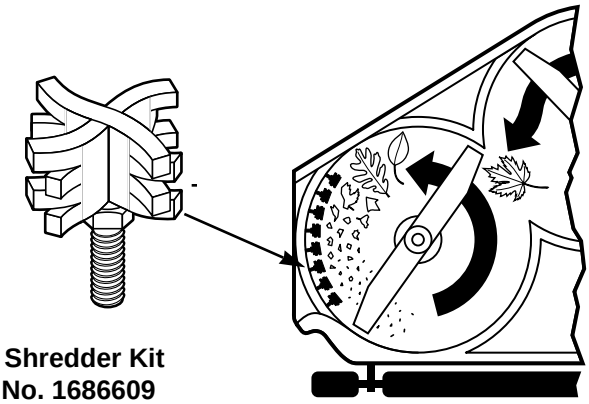
## Clippings Are Beneficial

A common misconception about clippings is that they automatically lead to thatch. However, clippings produced by mulching methods actually contribute to a healthy lawn because they:

- Act as a safe, non-polluting and inexpensive fertilizer that nourishes your lawn. Fresh cut blades are a rich source of nitrogen which is essential to lush growth. And one garbage bag of clippings contains about 1/4 lb. of usable organic nitrogen.
- Reduce the evaporation of water from your lawn.
- Provide a cushioning layer to reduce lawn wear.
- Moderate soil temperature.
- Save money normally spent on trash bags.

## Leaf Shredding (For use with Mulcher Kit Only)

Patented Shredder Blades virtually eliminate raking leaves. Up to 512 cutting edges pulverize leaves into tiny particles, which quickly and naturally decompose into food for your lawn. Shredder Blades must be removed when you choose to mulch grass clippings.



**Leaf Shredder Kit**
**Part No. 1686609**
**(Contains 8 shredders)**

## SCHEDULE

The following schedule should be followed for normal care of your tractor and mower. You will need to keep a record of your operating time. Determining operating time is easily accomplished by multiplying the time it takes to do one job by the number of times you've done the job, or you can install the optional hour meter.

| Safety Items | See Page | Before First Use | Before Each Use | Every 5 Hours | Every 25 Hours | Every 100 Hours | Spring & Fall |
|---|---|---|---|---|---|---|---|
| Check safety interlock system. | 7 | ● | | | | | ● |
| Check tractor brakes. | 22 | ● | | | | | ● |
| Check mower blade brake. | 24 | ● | | | | ● | |
| **Normal Care Items** | | | | | | | |
| Check tractor/ mower for loose hardware. | – | ● | ● | ● | | | |
| Check engine oil level. | * | ● | ● | ● | | | ● |
| Check engine air filter. | * | | | | ***● | | |
| Change engine oil and filter.** | * | | | | ***Every 50 hrs. | | ***● |
| Lubricate tractor & mower. | 14 | | | | ***● | | |
| Check tire pressure | 14 | ● | ● | | **● | | |
| Change transmission fluid. (Hydro only)**** | – | | Only if transaxle is serviced. | | | | |
| Check fuel filter. | 14 | | | | | ● | |
| Clean battery & cables | 15 | | | | | ● | |
| Clean/sharpen blades. | 16 | | | | ● | | |
| Inspect spark plug(s). | * | | | | | ● | |
| Check belt tension. | * | | | | | ● | ● |

* See the engine manufacturer's owner's manual.
** Change original engine oil after first 5 hours of operation.
*** More often in hot (over 85° F: 30° C) weather or dusty operating conditions.
**** Transaxle is a sealed unit and requires no regular interval fluid changes.

## RAISING THE HOOD & SEAT

1. To raise the hood, grasp the hood recess (figure 10) on top, then pivot the hood up and forward.
2. To raise the seat for battery access, tilt seat forward.

## CHECKING/ADDING GASOLINE

**⚠ CAUTION**

**Do not run the engine with the hood raised. Engine heat will cause damage to the headlight bezel and hood.**

**⚠ CAUTION**

**Never use gasoline containing METHANOL, gasohol containing more than 10% ethanol, gasoline additives, premium gasoline, or white gas because engine/fuel system damage could result.**

Raise the hood and check the fuel tank to be sure there is enough gasoline to complete the job. To add gasoline, remove the gas cap. Do not overfill. Leave room in the tank for fuel expansion. Refer to your engine manual for gasoline recommendations. Install and hand tighten the gas cap.

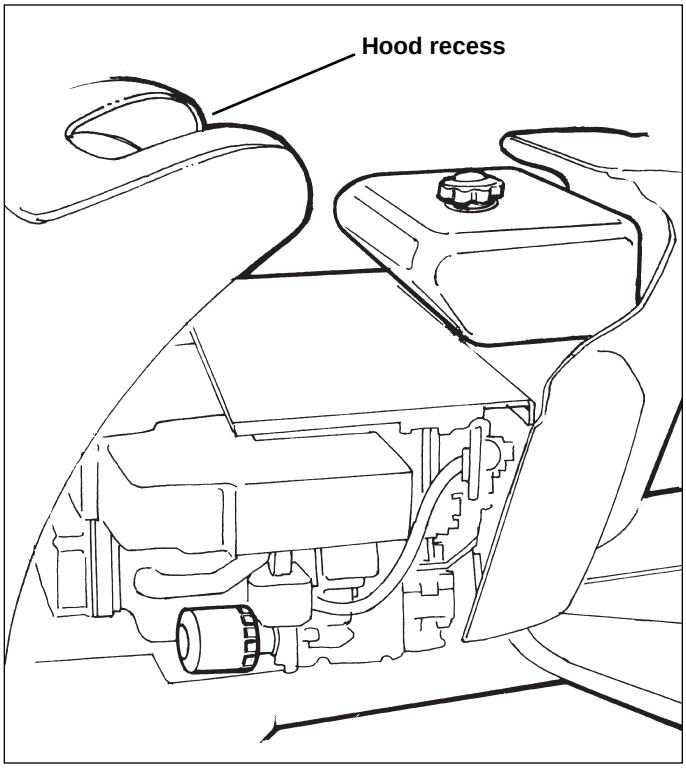



**Figure 10. Gas Tank Located Under Hood**

## CHECKING TIRE PRESSURE

Front tire pressure should be 12 - 15 psi (82 - 103 kPa).
Rear tire pressure should be 10 - 12 psi (56 - 82 kPa).

## CHECKING FUEL FILTER

The fuel filter is located in fuel line between fuel tank and carburetor. If filter is dirty or clogged, replace as follows. Place a container below filter to catch spilled gasoline.

**⚠ WARNING**

**Do not remove fuel filter when engine is hot, as spilled gasoline may ignite. DO NOT spread hose clamps further than necessary. Ensure clamps grip hoses firmly over filter after installation.**

1. Using a pliers, open and slide hose clamps from fuel filter.
2. Remove hoses from filter.
3. Install new filter in proper flow direction in fuel line. Secure with hose clamps. See warning at beginning of procedure.

## LUBRICATION

Lubricate the tractor as shown in figures 11 & 12. When a grease gun is shown, wipe the fitting clean, apply two or three shots of lithium base automotive grease (Simplicity part no. 103077), and wipe off excess grease. When an oil can is shown, wipe the area clean, apply a few drops of oil (SAE 30), then wipe up drips or spills.

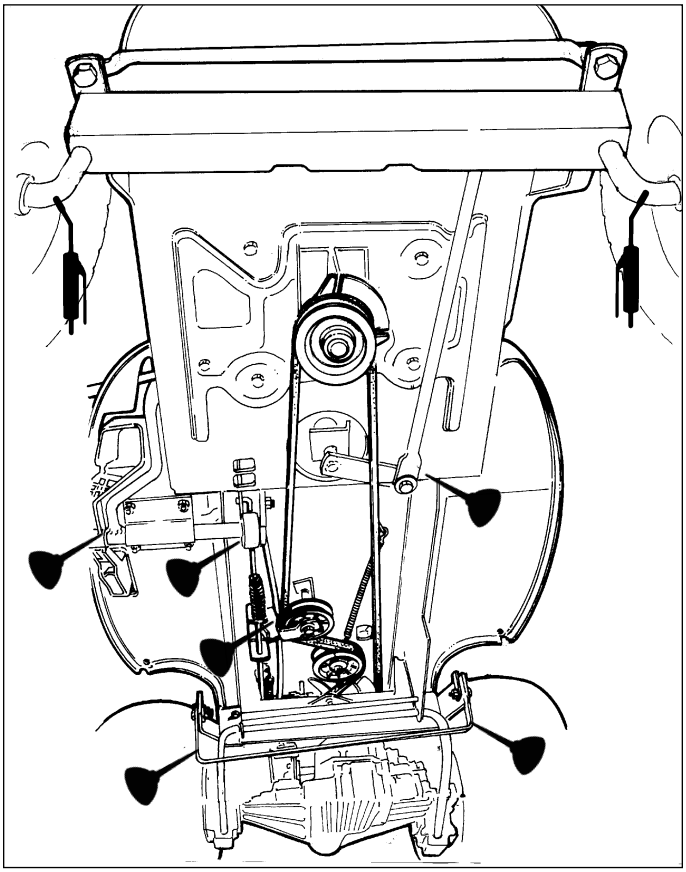


**Figure 11. Lubricating Tractor**

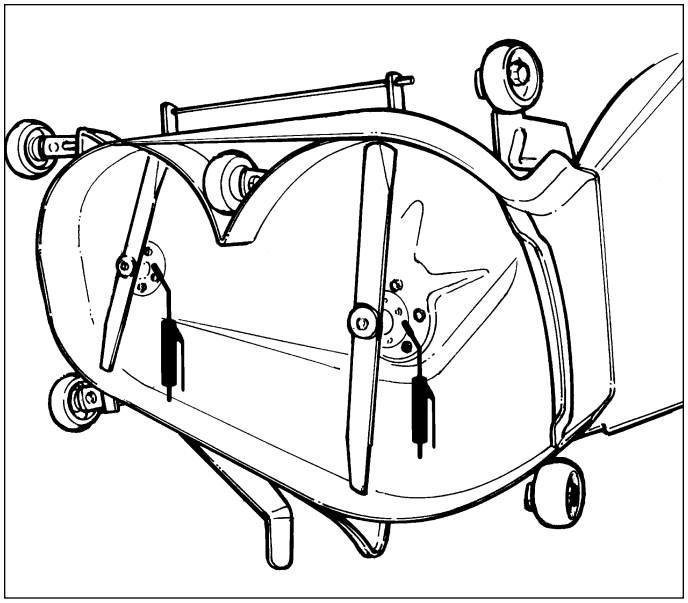


**Figure 12. Lubricating Mower Deck**

## TRANSAXLE - HYDRO MODELS

The hydro transaxle is a sealed unit. The transaxle is filled with oil and does not require any further lubrication unless a service overhaul is performed

## BATTERY MAINTENANCE

### Checking the Battery Fluid

1. Raise the seat by tilting it forward to gain access to the battery.

**⚠ WARNING**

**Be careful when handling the battery. Avoid spilling electrolyte. Keep flames and sparks away from the battery.**

2. Remove battery filler cap (C, figure 13). Fluid must be even with split ring full mark. If not, add distilled water.
3. Reinstall filler cap.

### Cleaning the Battery and Cables

**⚠ WARNING**

**When removing or installing battery cables, disconnect the negative cable FIRST and reconnect it LAST. If not done in this order, the positive terminal can be shorted to the frame by a tool.**

1. Disconnect the cables from the battery, negative cable first (B, figure 13).

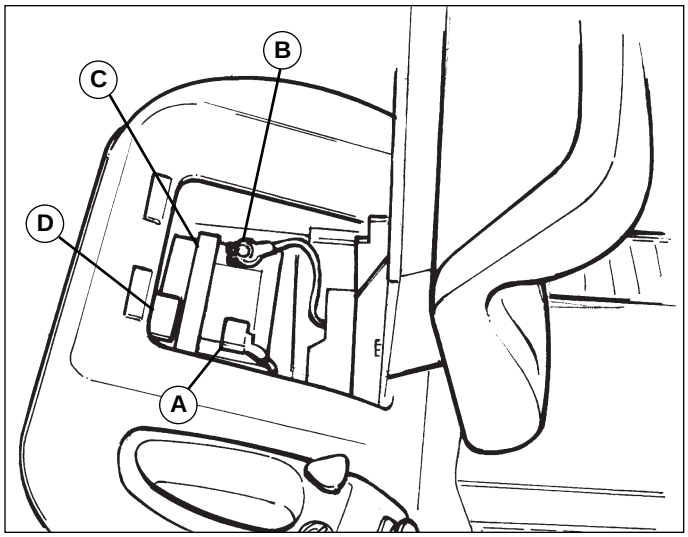



**Figure 13. Battery**
**A. Positive Battery Terminal C. Battery Cap**
**B. Negative Battery Terminal D. Battery Clamp**

2. Remove the battery clamp (D, figure 13), then remove the battery.
3. Scrub the battery, cables and battery compartment with baking soda and water.
4. Clean the battery terminals and cable clamps with a wire brush and battery post terminal cleaner.
5. Reinstall battery and clamp.
6. Connect cables, positive cable first. Position positive cable over seat switch harness to prevent harness from becoming pinched in seat pivot.
7. Coat cable clamps and terminals with grease or petroleum jelly.

## SERVICING THE MOWER BLADES

**⚠ WARNING**

**For your personal safety, do not handle the sharp mower blades with bare hands. Careless or improper handling of blades may result in serious injury.**

1. Remove mower from the tractor. See Mower Installation & Removal.
2. Blades should be sharp and free of nicks and dents. If not, sharpen blades as described in following steps.
3. To remove blade for sharpening, use wooden block to hold blade while removing the blade mounting capscrew (figure 14).
4. Use a file to sharpen blade to fine edge. Remove all nicks and dents in blade edge. If blade is severely damaged, it should be replaced.
5. Balance the blade as shown in figure 15. Center the blades' hole on a nail lubricated with a drop of oil. A balanced blade will remain level.
6. Reinstall each blade with the tabs pointing up toward deck as shown in figure 16. Secure with a capscrew, spring washer and hex washer. Use a wooden block to prevent blade rotation and torque capscrews to 50-70 ft.lbs. (67-95 N.m.).

**⚠ WARNING**

**For your personal safety, blade mounting capscrews must each be installed with a hex washer and spring washer, then securely tightened. Torque blade mounting capscrew to 50 - 70 ft. lbs. (67 - 95 N.m.)**

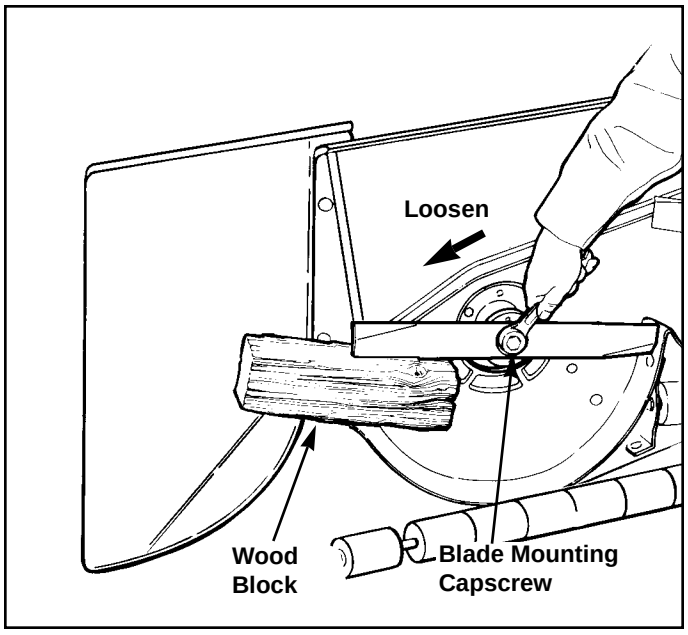



**Figure 14. Removing the Blade**

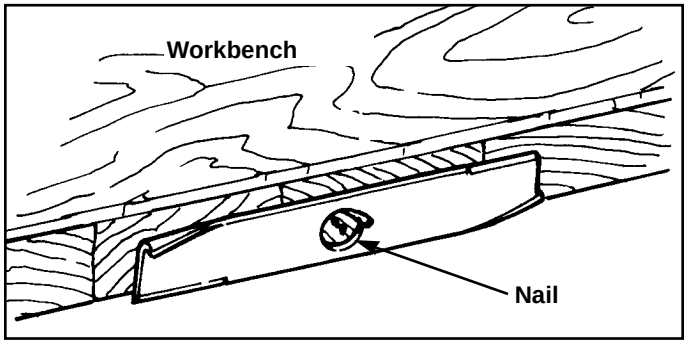



**Figure 15. Balancing The Blade**

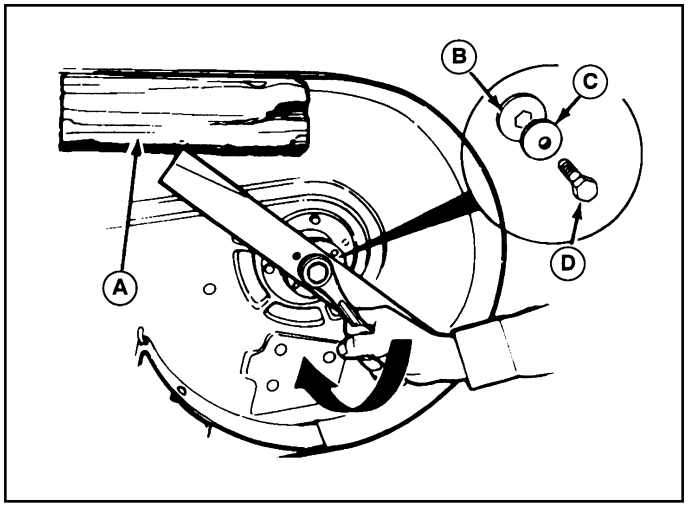



**Figure 16. Installing The Blade**

**A. 4x4 Wood Block**
**B. Hex Washer**
**C. Spring Washer**
**D. Blade Bolt**

**⚠ WARNING**

**Never store the tractor, with gasoline in engine or fuel tank, in a heated shelter or in enclosed, poorly ventilated enclosures. Gasoline fumes may reach an open flame, spark or pilot light (such as a furnace, water heater, clothes dryer, etc.) and cause an explosion.**

**Handle gasoline carefully. It is highly flammable and careless use could result in serious fire damage to your person or property.**

**Drain fuel into an approved container outdoors away from open flame or sparks.**

## TEMPORARY STORAGE (30 DAYS OR LESS)

Remember, the fuel tank will still contain some gasoline, so never store the tractor indoors or in any other area where fuel vapor could travel to any ignition source. Fuel vapor is also toxic if inhaled, so never store the tractor in any structure used for human or animal habitation.

Here is a checklist of things to do when storing your tractor temporarily or in between uses:

- Keep the tractor in an area away from where children may come into contact with it. If there's any chance of unauthorized use, remove the spark plug (s) and put in a safe place. Be sure the spark plug opening is protected from foreign objects with a suitable cover.
- If the tractor can't be stored on a reasonable level surface, chock the wheels.
- Clean all grass and dirt from the mower.

*NOTE: If storing your tractor between winter snow removal jobs in a cold area, we suggest that you fill the fuel tank at the completion of each job to prevent water condensation in the fuel tank. Wait for engine to cool before filling tank.*

## LONG TERM STORAGE (LONGER THAN 30 DAYS)

Before you store your tractor for the off-season, read the Maintenance and Storage instructions in the Safety Rules section, then perform the following steps:

1. Drain crankcase oil while engine is hot and refill with a grade of oil that will be required when tractor is used again.
2. Prepare the mower deck for storage as follows:
   a. Remove mower deck from the tractor.
   b. Clean underside of mower deck.
   c. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
3. Clean external surfaces and engine.
4. Prepare engine for storage. See engine owner's manual.
5. Clean any dirt or grass from cylinder head cooling fins, engine housing and air cleaner element.
6. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep out moisture, dirt and insects.
7. Completely grease and oil tractor as outlined in the Normal Care section.
8. Clean up tractor and apply paint or rust preventative to any areas where paint is chipped or damaged.
9. Be sure the battery is filled to the proper level with water and is fully charged. Battery life will be increased if it is removed, put in a cool, dry place and fully charged about once a month. If battery is left in tractor, disconnect the negative cable.
10. Drain fuel system completely or add a gasoline stabilizer to the fuel system. If you have chosen to use a fuel stabilizer and have not drained the fuel system, follow all safety instructions and storage precautions in this manual to prevent the possibility of fire from the ignition of gasoline fumes. Remember, gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.

*NOTE: Gasoline, if permitted to stand unused for extended periods (30 days or more), may develop gummy deposits which can adversely affect the engine carburetor and cause engine malfunction. To avoid this condition, add a gasoline stabilizer to the fuel tank or drain all fuel from the system before placing unit in storage.*

## STARTING AFTER LONG TERM STORAGE

Before starting the tractor after it has been stored for a long period of time, perform the following steps.

1. Remove any blocks from under the tractor.
2. Install the battery if it was removed.
3. Unplug the exhaust outlet and air cleaner.
4. Fill the fuel tank with fresh gasoline. See engine manual for recommendations.
5. See engine owner's manual and follow all instructions for preparing engine after storage.
6. Check crankcase oil level and add proper oil if necessary.
7. Inflate tires to proper pressure. Check fluid levels.
8. Start the engine and let it run slowly. DO NOT run at high speed immediately after starting. Be sure to run engine only outdoors or in well ventilated area.

## GENERAL

This section of the manual provides troubleshooting and repair instructions for the more common and easily corrected problems. For other problems, it is recommended that you contact your dealer.

**⚠ WARNING**

**To avoid serious injury, perform maintenance on the tractor or mower only when the engine is stopped and the parking brake engaged. Always remove the ignition key, disconnect spark plug wire and fasten away from the plug before beginning the maintenance, to prevent accidental starting of the engine.**

Locate the problem that best describes the trouble that you have encountered. Check the possible causes one at a time, in the order that they are listed.

## TROUBLESHOOTING THE TRACTOR

### Engine will not turnover or start.

1. Transmission not in neutral-start position. Place transmission in neutral.
2. PTO switch in up position (engaged). Place switch in down position to disengage PTO.
3. Out of fuel. Allow engine to cool then refill the fuel tank.
4. Engine flooded. Move throttle control out of CHOKE position .
5. Circuit breaker tripped. Wait one minute for automatic reset. Replace if defective (see your dealer).
6. Battery terminals require cleaning. See Normal Care section.
7. Battery discharged or dead. Recharge or replace.
8. Wiring loose or broken. Visually check wiring & replace broken or frayed wires. Tighten loose connections.
9. Solenoid or starter motor faulty. Repair or replace.
10. Safety interlock switch or module faulty. Replace if needed (see your dealer).
11. Spark plug faulty, fouled or incorrectly gapped. Clean and gap or replace. See engine manual.
12. Water in fuel. Drain fuel & refill with fresh fuel.
13. Old stale gas. Drain fuel & replace with fresh fuel.
14. Brake pedal not fully depressed (Gear model).

### Engine starts hard or runs poorly.

1. Fuel mixture too rich. Move control out of the choke position. If problem still exists, clean the air filter.
2. Carburetor adjusted incorrectly. See engine manual.
3. Spark plug faulty, fouled, or incorrectly gapped. Clean and gap or replace. See engine manual.

### Engine knocks.

1. Low oil level. Check/add oil as required.
2. Using wrong grade oil. See engine manual.

### Excessive oil consumption.

1. Engine running too hot. Clean engine fins, blower screen and air cleaner.
2. Using wrong weight oil. See engine manual.
3. Too much oil in crankcase. Drain excessive oil.

### Engine exhaust is black.

1. Dirty air filter. Clean air filter. See engine manual.
2. Choke not fully open. Move control out of choke and be sure choke opens fully. If problem still exists, check carburetor adjustments. See engine manual.

### Engine runs, but tractor will not drive.

1. Transmission in neutral. Shift in forward or reverse.
2. (Hydro models only) Transmission release lever in “push” position. Move into drive position.
3. Belt is broken. See Drive Belt Replacement.
4. Drive belt slips. See problem and cause below.
5. Brake not fully released.

### Tractor drive belt slips.

1. Pulleys or belt greasy or oily. Clean as required.
2. Belt stretched or worn. Replace with correct belt.
3. Clutch rod binding in guide. Oil clutch rod.

### Brake will not hold.

1. Brake is incorrectly adjusted. See Brake Adjustment.
2. Internal brake disc on transaxle worn. See your dealer.

### Tractor steers hard or handles poorly.

1. Steering linkage is loose. Check and tighten any loose connections. See Steering Gear Adjustment.
2. Improper tire inflation. Check and correct.
3. Spindle bearings dry. Grease spindles.

### Drive belt does not stop when clutch/brake pedal depressed.

1. Belt has shrunk. Replace belt.

### Tractor will not move with transmission in forward or reverse position.

1. Brake is not fully released. See Brake Adjustments.
2. Transmission release lever (hydro models) not fully in drive position. See Pushing The Tractor By Hand.

## TROUBLESHOOTING THE MOWER

### Mower cut is uneven.

1. Tractor tires not inflated equally or properly. See Normal Care.
2. Mower not leveled properly. See Mower Adjustment.

### Mower cut is rough looking.

1. Engine speed too slow. Set to full speed.
2. Ground speed too fast.
3. Blades dull and require sharpening. See Servicing the Mower Blades.
4. Mower drive belt slipping. Belt oily or worn. Clean or replace belt as necessary.
5. Blades not properly fastened to arbors. See Servicing the Mower Blades.

### Engine stalls easily with mower engaged.

1. Engine speed too slow. Set for 3/4 to full throttle.
2. Ground speed too fast.
3. Carburetor not adjusted properly.
4. Cutting height set too low when mowing tall grass. Cut tall grass at maximum cutting height during first pass.
5. Discharge chute jamming with cut grass. Cut grass with discharge pointing toward previously cut area.

### Excessive mower vibration.

1. Blade mounting screws are loose. Torque to 50-70 ft. lbs. (74 Nm).
2. Mower blades, arbors, or pulleys are bent. Check and replace as necessary.
3. Mower blades are out of balance. Remove, sharpen and balance blades. See Servicing the Mower Blades.
4. Belt installed incorrectly. See Belt Replacement.

### Excessive belt breakage.

1. Bent or rough pulleys. Repair or replace.
2. Using incorrect belt. See your dealer.
3. Mower not leveled properly.

### Mower drive belt slips or fails to drive.

1. Mower drive belt broken. Replace.

## CHECKING THE BATTERY

A voltmeter can be used to determine condition of battery. When engine is off, the voltmeter shows battery voltage, which should be 12 volts. When engine is running, the voltmeter shows voltage of charging circuit which normally is 13 to 14 volts.

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. It may, as an example, mean that the alternator is not charging the battery properly. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under Cleaning the Battery & Cables in the Normal Care Section.

## CHARGING A COMPLETELY DISCHARGED BATTERY

**⚠ WARNING**

**Do not attempt to charge a frozen battery. Allow the battery to warm to 60° F (15.5° C) before placing on charge.**

**⚠ WARNING**

**Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.**

1. Be aware of all the safety precautions you should observe during the charging operation. If you are unfamiliar with the use of a battery charger and hydrometer, have the battery serviced by your dealer.
2. Add water sufficient to cover the plate (fill to the proper level near the end of the charge). If the battery is extremely cold, allow it to warm before adding water because the water level will rise as it warms. Also, an extremely cold battery will not accept a normal charge until it becomes warm.
3. Always unplug or turn the charger off before attaching or removing the clamp connections.
4. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).
5. While charging, periodically measure the temperature of the electrolyte. If the temperature exceeds 125° F (51.6° C), or if violent gassing or spewing of electrolyte occurs, the charging rate must be reduced or temporarily halted to prevent battery damage.

6. Charge the battery until fully charged (i.e. until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). The best method of making certain a battery is fully charged, but not over charged, is to measure the specific gravity of a cell once per hour. The battery is fully charged when the cells are gassing freely at low charging rate and less than 0.003 change in specific gravity occurs over a three hour period.

**⚠ WARNING**

**For your personal safety, use extreme care when jump starting. Never expose battery to open flame or electric spark – battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.**

## JUMP STARTING WITH AUXILIARY (BOOSTER) BATTERY

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and discharged batteries should be treated carefully when using jumper cables. Follow the steps below EXACTLY, being careful not to cause sparks. Refer to figure 17.

1. Both batteries must be of the same voltage (6, 12, etc.).
2. Position the vehicle with the booster battery adjacent to the vehicle with the discharged battery so that booster cables can be connected easily to the batteries in both vehicles. Make certain vehicles do not touch each other.
3. Wear safety glasses and shield eyes and face from batteries at all times. Be sure vent caps are tight. Place damp cloth over vent caps on both batteries.
4. Connect positive (+) cable to positive post of discharged battery (wired to starter or solenoid).
5. Connect the other end of same cable to same post marked positive (+) on booster battery.
6. Connect the second cable negative (-) to other post of booster battery.
7. Make final connection on engine block of stalled vehicle away from battery. Do not lean over batteries.
8. Start the engine of the vehicle with the booster battery. Wait a few minutes, then attempt to start the engine of the vehicle with the discharged battery.
9. If the vehicle does not start after cranking for thirty seconds, STOP PROCEDURE. More than thirty seconds seldom starts the engine unless some mechanical adjustment is made.
10. After starting, allow the engine to return to idle speed. Remove the cable connection at the engine or frame. Then remove the other end of the same cable from the booster battery.
11. Remove the other cable by disconnecting at the discharged battery first and then disconnect the opposite end from the booster battery.
12. Discard the damp cloths that were placed over the battery vent caps.

**⚠ WARNING**

**To avoid engine damage, do not disconnect battery while engine is running. Be sure terminal connections are tight before starting.**

**⚠ WARNING**

**Any procedure other than the preceding could result in: (1) personal injury caused by electrolyte squirting out the battery vents, (2) personal injury or property damage due to battery explosion, (3) damage to the charging system of the booster vehicle or of the immobilized vehicle.**

**Do not attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen or if the electrolyte fluid cannot be seen, do not attempt to start with jumper cables as long as the battery remains frozen.**

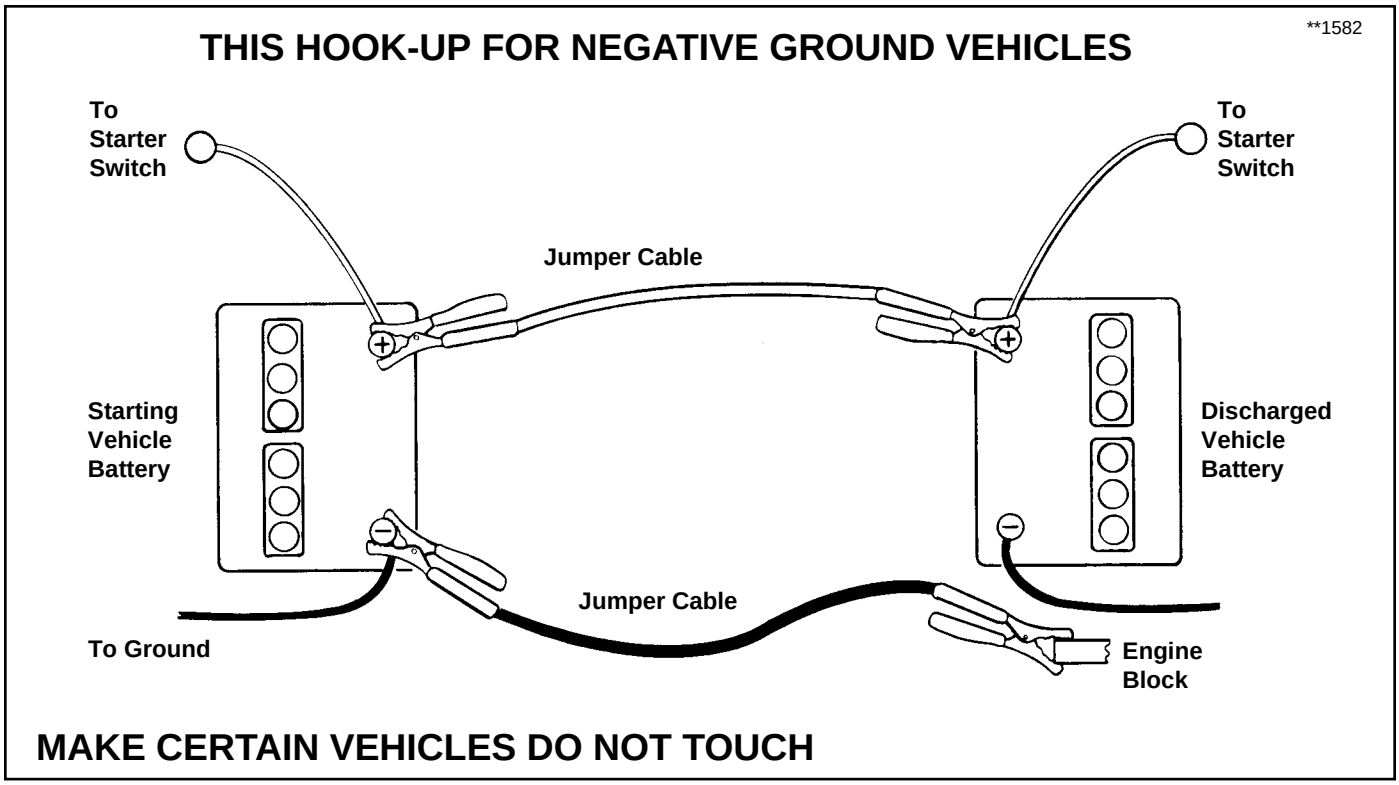



**Figure 17. Battery Jump Starting Diagram**

## Adjustments

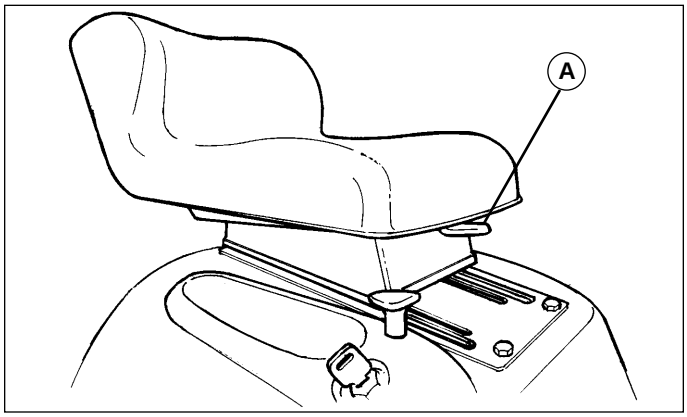



**Figure 18. Seat Adjustment**
**A. Seat Adjustment Lever**

**⚠WARNING**

**To avoid serious injury, perform adjustments only with engine stopped, key removed and tractor on level ground.**

### SEAT ADJUSTMENT

The seat can be moved forward and back by moving the lever (A, figure 18) underneath the front of the seat, then positioning the seat as desired.

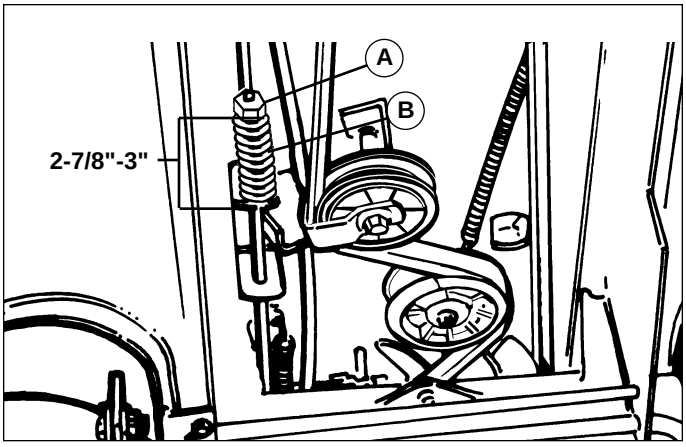



**Figure 19. Brake Spring Adjustment**
**A. Nut B. Spring**

### BRAKE ADJUSTMENT

1. Fully depress brake pedal and lock parking brake.
3. See figure 19. Adjust the brake rod nut (A) until spring (B) is compressed to 2-7/8" - 3" length.

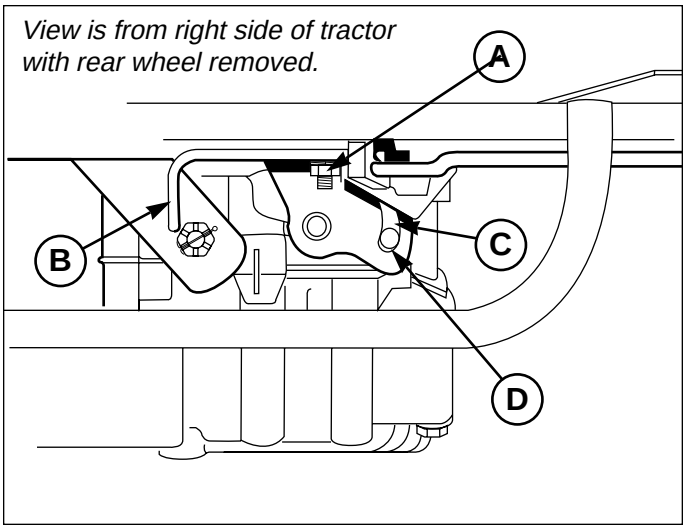



**Figure 20. Neutral Adjustment - Hydro Model**

**A. Nut** **C. Cam Slot**
**B. Neutral Adjustment Rod** **D. Stop Pin**

## NEUTRAL ADJUSTMENT - HYDRO

If the tractor creeps forward or backward with the engine running and both travel pedals released, perform the following adjustment:

1. Raise the rear of the tractor off the ground with suitable hoist or floor jack. Install jackstands underneath the transaxle and block the front wheels.
2. Start the engine and release the parking brake while keeping seat switch depressed.
3. See figure 20. Loosen the nut (A) securing the neutral adjustment rod (B). Move the rod until neutral is found, then retighten the nut.
4. The stop pin (D, figure 20) should be positioned 1/8" - 3/16" from the end of the cam slot (C, figure 20) as shown when the front pedal edge is 1/4" above the frame (pedal fully depressed). *If it is not, proceed to the Forward Speed Adjustment procedure below.*

## FORWARD SPEED ADJUSTMENT - HYDRO

If the unit does not reach top speed with the forward direction pedal fully depressed, perform the following adjustment with the engine off and PTO disengaged.

1. See figures 21a & 21b. Loosen the nut (A, figure 21a) securing the control rod (B) to the hydro control lever.

*NOTE: Hydro control rod (B) should be on the inside of the hydro control lever (C). If the rod is not in that position, remove the hardware, reposition the rod as shown.*

2. Position the pedal so the distance between the frame and bottom edge of the pedal is 1-3/4" as shown in figure 21b.
3. With pedal in this position, tighten the nut (A, figure 21a).
4. The stop pin (D, figure 20) should be positioned 1/8" to 3/16" from the end of the cam slot (C, figure 20) as shown

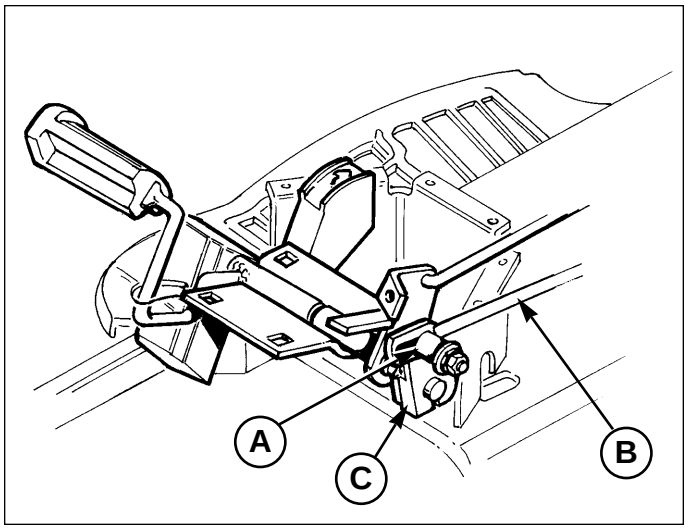



**Figure 21a. Forward Speed Adjustment - Hydro**

**A. Bolt** **C.Hydro Control Lever**
**B. Control Rod**

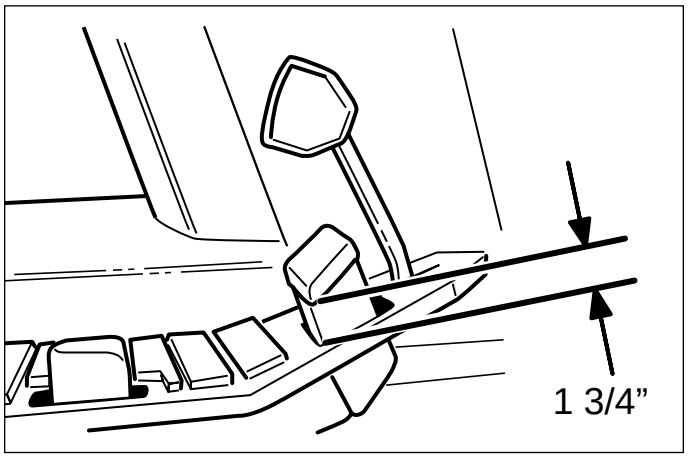



**Figure 21b. Forward Speed Adjustment - Hydro**

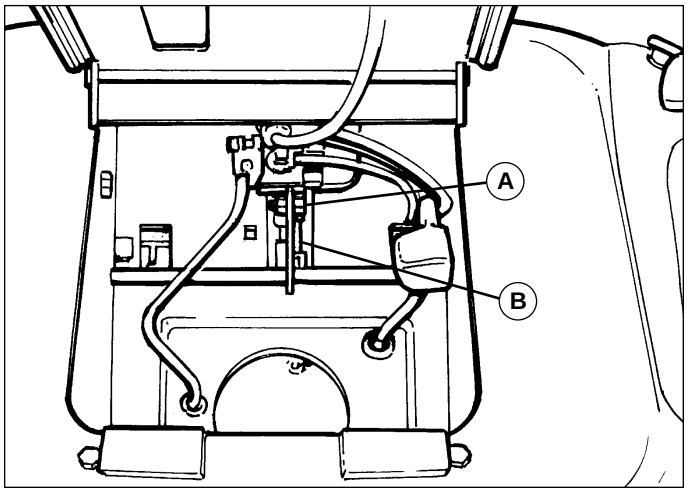



**Figure 22. Neutral Adjustment - Gear Model**

**A. Hardware** **B. Shaft**

when the front pedal edge is 1/4" above the frame (pedal fully depressed). If it is not, loosen nut (A, figure 21), readjust pedal as necessary, then retighten nut.

## NEUTRAL ADJUSTMENT - GEAR

If the tractor creeps forward or backward with the gear selector in the neutral gate and the engine running, perform the following adjustment:

1. Release the parking brake. Move the gear selector until neutral is found and the tractor can be wheeled freely back and forth.
2. See figure 22. Raise the seat and loosen the hardware (A) securing the gear selector shaft (B).
3. Place the gear selector shaft in the neutral gate and retighten the hardware securing shaft.

## STEERING GEAR ADJUSTMENT

If there is excessive slack in the steering system, the steering gear back lash can be eliminated with the following adjustment.

1. See figure 23. Loosen the two capscrews and adjust the bracket so the gear teeth are closely meshed.
2. Tighten capscrews after adjustment.

## MOWER ADJUSTMENTS

**⚠WARNING**

**Before checking mower, shut off PTO and engine. Allow all moving parts to stop. Remove ignition key, then disconnect the spark plug wire and fasten it away from the spark plug.**

### Leveling The Mower

If the cut is uneven, the mower may need leveling. Unequal or improper tire pressure may also cause an uneven cut. Tire pressure should be as follows:

- Front: 12 - 15 psi (82-103 kPa)
- Rear: 10 - 12 psi (56-82 kPa)

1. With the mower installed, place the tractor on a smooth, level surface such as a concrete floor. Turn the front wheels straight forward.
2. Check for bent blades and replace if necessary.
3. Place the mower in high-cut position. Arrange the mower blades so that they are pointing from side-to-side (figure 24).
4. See figure 24. Measure the distance between the outside tips of each blade and the ground. If there is more than 1/8" (3mm) difference between the measurements on each side, proceed to step 5. If the difference is 1/8" (3mm) or less, proceed to step 6.

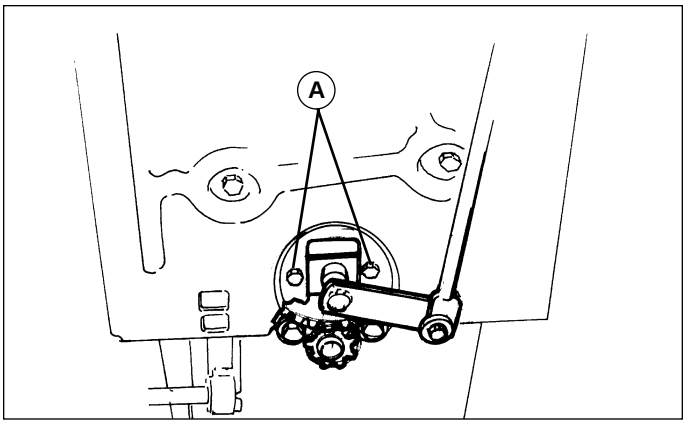



**Figure 23. Steering Gear Adjustment**
**A. Capscrews**

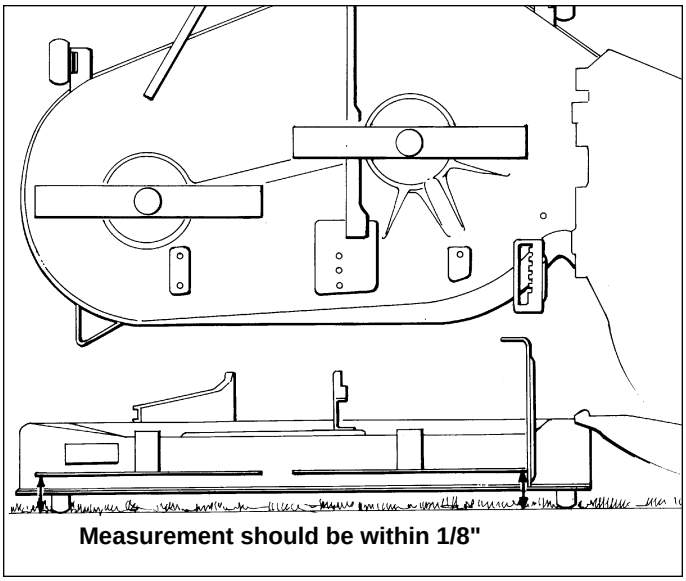



**Figure 24. Leveling the Mower Deck Side-to-Side (38” Mower Deck Shown)**

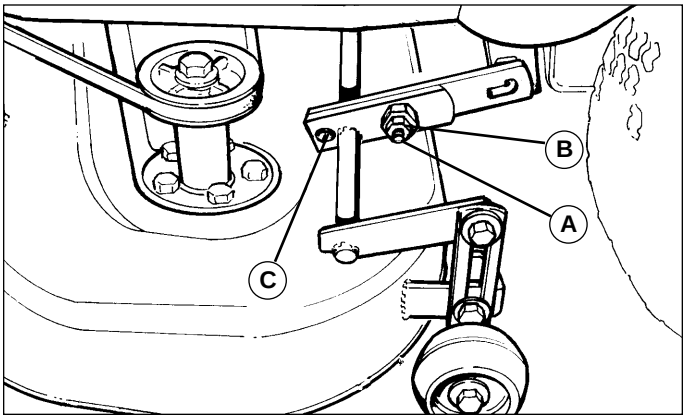



**Figure 25. Side-to-Side Adjustment**
**A. Outside Nut**
**B. Eccentric Nut**
**C. Taptite Screw**

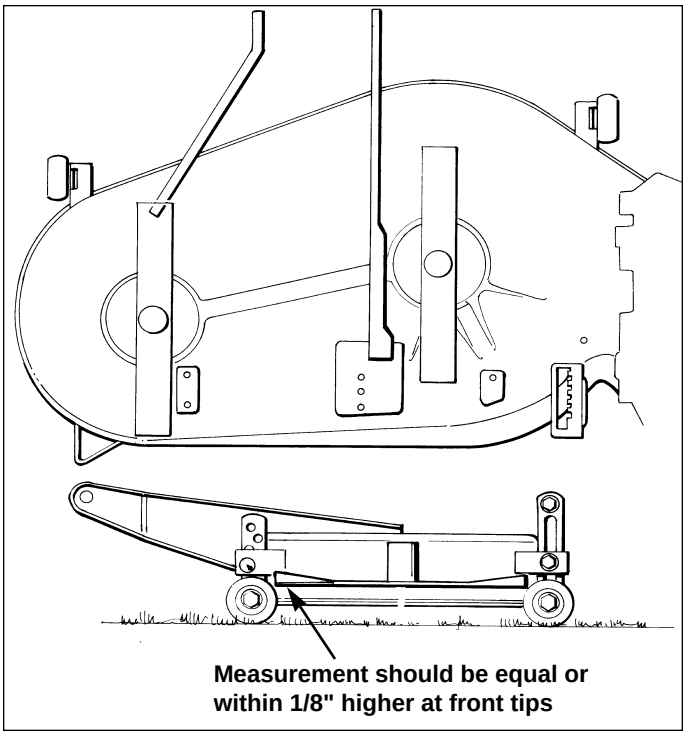



**Figure 26. Leveling the Mower Deck Front-to-Back 38” Mower Deck Shown)**

5. See figure 25. Loosen the outside nut (A) and taptite screw (C), then turn the eccentric nut (B) to raise or lower the left side of the deck. When the mower deck is level, hold the eccentric nut while tightening the outside nut. Tighten the taptite screw (C).

*NOTE: When using a turbo collection system, front gauge wheels should be adjusted so they rest on the ground.*

6. Arrange the blades so they face front-to-back (figure 26).
7. See figure 26. Measure the distance from the ground to the front and rear tips of each blade. The measurement should be equal for both blades. Front tips should be equal to rear tips or within 1/8" higher. If not, proceed to step 8.
8. See figure 27. Loosen the outside nut (A) and turn the eccentric nut (B) to raise or lower the rear of the deck. When the mower deck is level, hold the eccentric nut while tightening the outside nut.

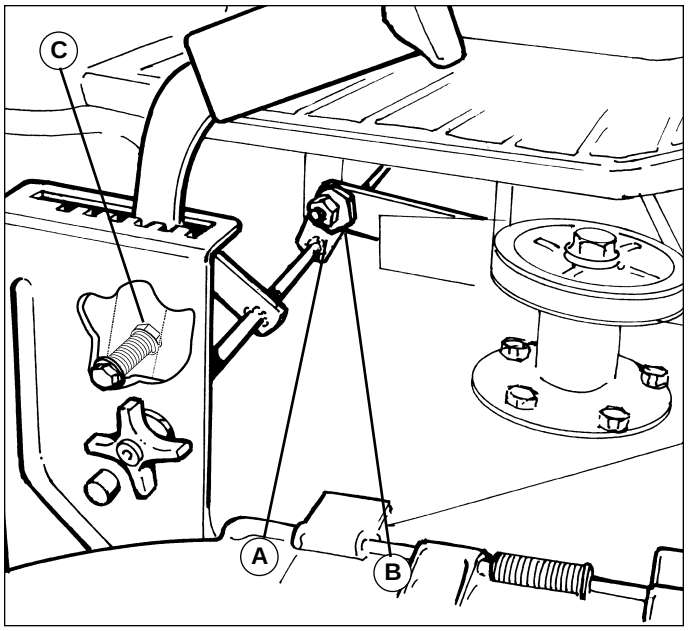



**Figure 27. Front-to-Back Adjustment Nut**
**A. Outside Nut** **C. Adjustment Nut**
**B. Eccentric Nut**

*NOTE: If mower handle drops out of cutting height quadrant, turn adjustment nut (C, figure 27) clockwise to increase spring tension. DO NOT tighten nut all the way so that spring is solid.*

## Blade Brake Check

Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned off.

1. With tractor in neutral, PTO disengaged and operator in seat, start the engine.
2. Look over the left-hand footrest at the mower drive belt. Engage the PTO and wait several seconds. Disengage the PTO and check the amount of time it takes for the mower drive belt to stop.
3. If mower drive belt does not stop within five seconds, see your dealer.

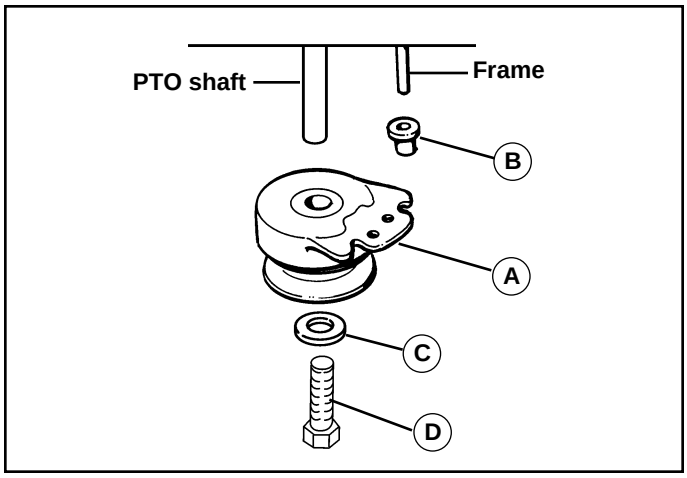



**Figure 28. PTO (Electric Clutch) Assembly**

**A. PTO** **C. Washer**
**B. Sleeve** **D. Capscrew**

**⚠ CAUTION**

**To avoid damaging belts, do not pry belts over pulleys.**

## TRACTOR DRIVE BELT

1. Park the tractor on a level surface. Disengage the PTO, turn off the engine and set the parking brake. Remove the key.
2. Remove the mower deck from the tractor. See Mower Installation & Removal on page 8.
3. Unplug the wiring harness from the PTO. Remove the PTO as shown in figure 28.
4. Remove the drag link rear hardware. When reassembling, apply Loctite to nut before tightening.
5. **On gear models,** disconnect the wires from the neutral switch on the transmission.

   **On hydro models,** loosen the belt stop on the transmission pulley. Belt stop hardware is located on the inside of RH frame. Move belt stop out of the way. Belt stop should be positioned 1/8" from belt when new belt is installed and hardware is tightened.
6. Carefully slide belt over transmission pulley and remove from other pulleys.
7. Install new belt as shown in figures 29 & 30.
8. Reverse steps 1-7..

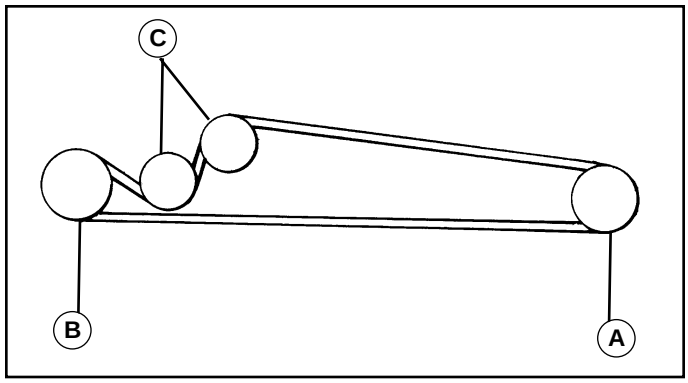



**Figure 29. Drive Belt Routing - Hydro Models**

**A. Engine Pulley** **C. Idler Pulley**
**B. Transmission Pulley**

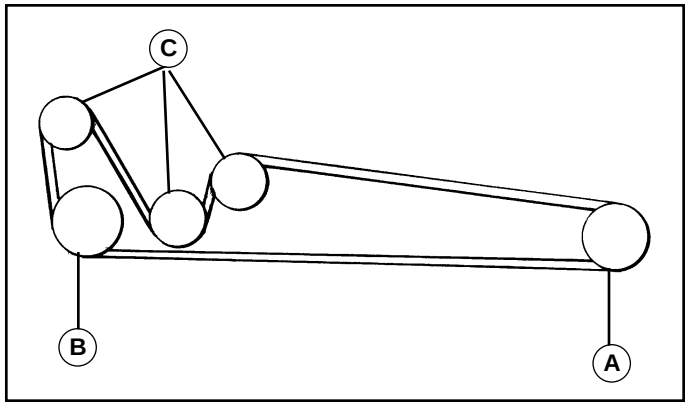



**Figure 30. Drive Belt Routing - Gear Model**

**A. Engine Pulley** **C. Idler Pulley**
**B. Transmissioin Pulley**

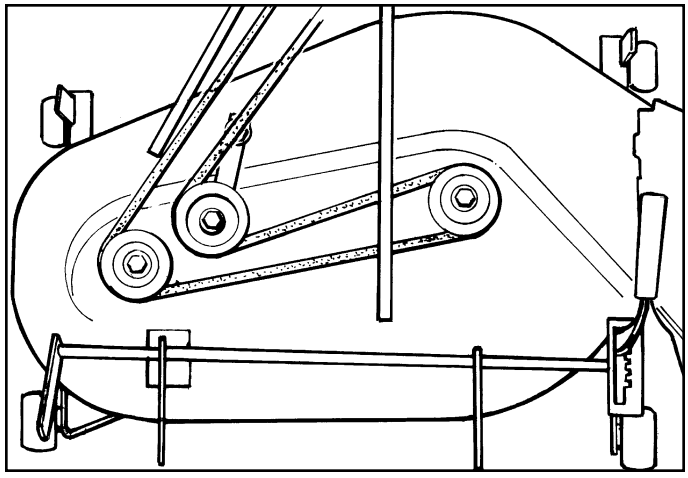


**Figure 31. Mower Deck Belt Routing**

## MOWER DECK BELT

1. Park the tractor on a level surface. Disengage the PTO, turn off the engine and set the parking brake. Remove the key.
2. Remove the mower deck from the tractor. See Mower Installation & Removal in the Operation section.
3. Remove the old belt and install the new belt over the pulleys as shown in figure 31.
4. Reinstall the mower deck on the tractor.

# Specifications

*NOTE: Specifications are correct at time of printing and are subject to change without notice.*

## ENGINE

### 14 HP Briggs & Stratton

| | |
|---|---|
| **Make:** | Briggs & Stratton - 4 cycle air cooled |
| **Model & Type:** | See engine I.D. plate |
| **Horsepower:** | 14 HP @ 3600 rpm (Eng. Mfg's. Rating) |
| **Cylinder:** | 1 horizontal |
| **Bore & Stroke:** | 3.44 x 3.06 inches (87.3 x 77.7 mm) |
| **Displacement:** | 28.4 cu. in. (465 cc) |
| **Construction:** | Overhead valve, cast iron sleeves, aluminum crankcase |
| **Electrical:** | Hydro - 12 volt 9 amp. alternator regulated battery, 12 volt, 340 cranking amps, 41 minute reserve capacity.<br>Gear - unregulated 3 amp. DC charging circuit. |
| **Governor:** | Mechanical full throttle -<br>no load setting @ 3400 ± 100 rpm;<br>idle speed @ 1750 ± 200 rpm |
| **Oil Capacity:** | 4.0 pints w/filter (1.9 L) |
| **Ignition:** | Magnetron electronic |
| **Charging:** | Unregulated 3-amp DC charging circuit |
| **Air Cleaner:** | Ducted paper cartridge and foam pre-cleaner |
| **Fuel Tank:** | High density polyurethane construction; 2 gallons (7.57 liters) of "regular" grade leaded or nonleaded gasoline. |
| **Muffler** | Large, low back pressure, remote canister type |
| **Starter:** | 12 volt electric gear drive |

### 15.5 HP Briggs & Stratton

| | |
|---|---|
| **Make:** | Briggs & Stratton - 4 cycle air-cooled |
| **Model & Type:** | Daimond I/C |
| **Horsepower:** | 15.5 HP |
| **Cylinder:** | Dura Bore |
| **Bore & Stroke:** | 3.44in.(87.3)mm |
| **Displacement:** | 28.4cu.in.(465cc) |
| **Construction:** | Overhead valve, Dura Bore Sleeves, Aluminum Crankcase. |
| **Electrical:** | Hydro - 12 volt 9 amp, alternator regulated battery, 12 volt, 340 cranking amps, 41 minute reserve capacity. |
| **Governor:** | Mechanical |
| **Oil Capacity:** | 3 Pints w/Filter (1.4 L) |
| **Ignition:** | Magnetron Electronic |
| **Charging:** | Unregulated 3 amp DC charging circuit |
| **Air Cleaner:** | Tri-Clean |
| **Fuel Tank:** | High Density polyurethane construction; 2 gallons (7.57 liters) of "regular" grade leaded or non-leaded gasoline. |
| **Muffler:** | Square Lo-Tone |
| **Starter:** | Electric |

### 16 HP Briggs & Stratton

| | |
|---|---|
| **Make:** | Briggs & Stratton - 4 cycle air cooled |
| **Model & Type:** | Vanguard |
| **Horsepower:** | 16 HP |
| **Cylinder:** | 1 |
| **Bore & Stroke:** | 3.44 in./87.3 MM (3.06 in./77.7 MM) |
| **Displacement:** | 28.4 cu.in.(465cc) |
| **Construction:** | Overhead valve, Cast Iron Sleeves, Aluminum Crankcase. |
| **Electrical:** | Hydro - 12 volt 9 amp, alternator regulated battery, 12 volt, 340 cranking amps, 41 minute reserve capacity. |
| **Governor:** | Mechanical |
| **Oil Capacity:** | 3.5 Pints w/Filter (1.7 L) |
| **Ignition:** | Magnetron Electronic |
| **Charging:** | Unregulated 3 amp DC charging circuit |
| **Air Cleaner:** | Dual Element |
| **Fuel Tank:** | High Density polyurethane construction; 2 gallons (7.57 liters) of "regular" grade leaded or non-leaded gasoline. |
| **Muffler:** | Super LoTone |
| **Starter:** | 12 volt electric gear drive |

## TRANSMISSION - GEAR

| | | |
|---|---|---|
| **Type:** | Spur gear | |
| **Material:** | Shaft hardened | |
| **Lubrication:** | Oil | |
| **Ground speeds** | **1st gear :** | 1.0 mph (1.6 km/h) |
| **@ 3400 rpm:** | **2nd gear :** | 2.0 mph (3.2 km/h) |
| | **3rd gear :** | 2.9 mph (4.7 km/h) |
| | **4th gear :** | 3.9 mph (6.3 km/h) |
| | **5th gear :** | 4.3 mph (6.9 km/h) |
| | **Reverse :** | 1.3 mph (2.1 km/h) |

## TRANSMISSION - HYDRO

| | |
|---|---|
| **Type:** | Hydrostatic |
| **Pump:** | Variable displacement axial piston |
| **Motor:** | Fixed displacement axial piston |
| **Control:** | Foot pedal, free-wheeling lever for manual tractor movement |
| **Ground speeds @ 3400 rpm:** | **Forward:** 0-4.7 mph (7.5 km/h)<br>**Reverse:** 0-2.6 mph (4.1 km/h) |

## DIMENSIONS

| | |
|---|---|
| **Height :** | 41.25 in. (105 cm) — at steering wheel |
| **Width:** | 35 in. (89 cm) |
| **Length:** | 67.75 in. (172.1 cm) |
| **Wheel Base:** | 45.5 in. (116 cm) |
| **Weight**: | 90 lbs. (40.1 kg) — with Mower |
| **Cutting Width:** | 38 in. (9.65 cm) |
| **Cutting Height:** | Variable between 1" - 3.9" (215 - 9.9 cm) |
| **Front Tires:** | 15 x 6.00 x 6 pneumatic 12-15 psi (82-103 kPa) |
| **Rear Tires:** | 18 x 8.50 x 8 pneumatic, 10-12 psi (56-82 kPa) |
| **Turning radius:** | Inside rear tire 14" (35.6 cm) |

## Replacement Parts

| | |
|---|---|
| Tractor Drive Belt - Hydro (16 HP) | 108209 |
| Tractor Drive Belt-Hydro (14 HP) | 1672135 |
| Tractor Drive Belt-Gear Models (All) | 1657044 |
| 44” Mower Drive Belt | 1715674 |
| 44” Mower Blades | 1714100 |
| 38” Mower Drive Belt | 1666698 |
| 38” Mower Blade - RH | 1704101 |
| 38” Mower Blade - LH | 1704856 |
| Fuel Filter | 173206 |
| Battery | 1685215 |
| Ignition Key | 1714054 |
| Headlight Bulb | 1677371 |
| Interlock Switch - PTO | 1714772 |
| Interlock Switch - Seat | 1714771 |
| Interlock Switch - Foot pedals | |
| - Switch, Black (normally open) | 1704379 |
| - Switch, Gray (normally closed) | 1714770 |

## Maintenance Items

| | |
|---|---|
| Engine Oil | |
| SAE 5W-30 SF/CD (Cold Weather 30° & under) | 1685576 |
| SAE 30W SG/CC (Warm weather 32° & up) | 1685659 |
| Touch-Up Paint | |
| Deep Orange, 13 oz. spray can | 1685611 |
| Deep Orange, 1 quart can | 1685612 |
| Deep Orange, 1/2 oz. bottle w/brush cap | 1685615 |
| Gloss Black, 13 oz. spray can | 1685639 |
| Gloss Black, 1 quart can | 1685641 |
| Metallic Grey, 13 oz. spray can | 1685718 |
| Red, 13 oz. spray can | 1685722 |
| Grease Gun Kit w/8 oz. Grease Tube | 1685510 |
| Replacement 8 oz. Grease Tube for above | 103077 |
| Tire Sealant | |
| 11 oz. Tube | 1685523 |
| Cleaner, Polish, Sealant & Protectant | |
| 8 oz. Bottle | 1685696 |
| Degrimer/Degreaser | |
| 32 oz. Bottle w/Trigger Spray | 1685619 |
| 1 gallon | 1685621 |
| Gas Stabilizer | |
| 8 oz. Bottle | 1685748 |
| Case of 12 - 8 oz. Bottles | 1685747 |

## Optional Accessories

| | |
|---|---|
| Snowthrower Cab | 1692629 |
| 42” Single Stage Snowthrower | 1691522 |
| 36" Single Stage Snowthrower | 1691521 |
| Snowthrower Hitch | 1692622 |
| Snwothrower/Dozer Lift Lever | 1692623 |
| 42" Dozer/Snow Blade | 1691520 |
| Dozer Hitch | 1692624 |
| Rear Wheel Weights | 1690555 |
| Rear Weight | 1692625 |
| Rear Weight Hitch | 1692636 |
| Tire Chains | 1690183 |
| Turbo Twin Bag Grass Catcher | 1692621 |
| 38" Turbo Blower | 1692626 |
| Twin Bag Grass Catcher | 1692620 |
| Front Counterweight | 1691837 |
| Dump Cart | 1600236 |
| Designer Seat Cover | 1685540 |
| Hour Meter Kit | 1685535 |
| Gas Cans | |
| 1 gallon | 1685587 |
| 2-1/2 gallon | 1685555 |
| 5-1/4 gallon | 1685556 |

## Technical Literature

Manuals are fully illustrated. All of the assemblies are shown in exploded views which show the relationship of the parts and how they go together. Important assembly notes and special torque values are included in the illustrations. Standard hardware and torque specification charts are also included.

For the manual applicable for your model, contact the Customer Publications Department at 414-284-8519. Have the following information available when phoning in your request.

**Model:** _____

**Mfg. No.:** _____

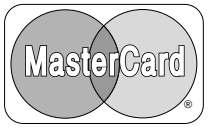
**Your Name:** _____

**Address:** _____

**City, State, Zip:** _____

**Visa/Mastercard No.:** _____

**Card Expiration Date:** _____




**USE ONLY GENUINE FACTORY REPLACEMENT PARTS Available Through Your Local Authorized Dealer.**

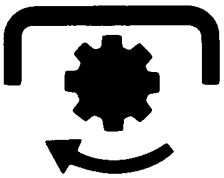
## INTERNATIONAL SYMBOLS

Choke

Fast (Throtttle)

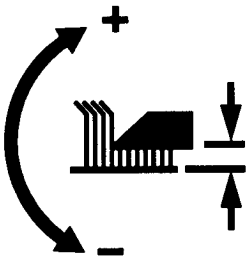
Slow (Throttle)

Throttle



PTO Clutch Engaged

Parking Brake



Mower Cutting
Height Adjustement